Revision

1. Write the following numbers in words :

(a) 37,283 = _____

(b) 15,096 = _____

(c) 3,48,154 = _____

(d) 6,90,200 = _____

(e) 13,42,560 = _____

(f) 54,10,309 = _____

2. Write the following numbers in figures :

(a) Fifty thousand six hundred eight = _____

(b) Thirteen lakh eighty two thousand nine hundred = _____

(c) Six lakh forty five thousand eight hundred twelve = _____

(d) Two thousand nine hundred seventy two = _____

(e) Ninety four lakh thirty five thousand six hundred forty one

= _____

(f) Eighteen lakh forty six thousand seven hundred eighty seven

= _____

3. Fill in the blanks :

Predecessors	Numbers	Successors
(a) _____	549	_____
(b) _____	1,830	_____
(c) _____	67,153	_____
(d) _____	29,200	_____

(e) _____   3,86,189   _____

(f) _____   2,49,568   _____

4. Write each of the following in expanded form :

(a) 42,835   = [ ] + [ ] + [ ] + [ ] + [ ]

(b) 53,106   = [ ] + [ ] + [ ] + [ ] + [ ]

(c) 3,10,825   = [ ] + [ ] + [ ] + [ ] + [ ] + [ ]

(d) 6,72,189   = [ ] + [ ] + [ ] + [ ] + [ ] + [ ]

(e) 62,54,138   = [ ] + [ ] + [ ] + [ ] + [ ] + [ ] + [ ]

(f) 91,12,540   = [ ] + [ ] + [ ] + [ ] + [ ] + [ ] + [ ]

5. Write each of the following in short form :

(a) 60,000 + 1,000 + 200 + 50 + 9   = [ ]

(b) 30,000 + 6,000 + 800 + 90 + 7   = [ ]

(c) 1,00,000 + 50,000 + 900 + 70 + 2   = [ ]

(d) 9,00,000 + 20,000 + 4,000 + 600 + 80 + 1   = [ ]

(e) 30,00,000 + 4,00,000 + 50,000 + 7,000 + 300 + 10 + 5   = [ ]

(f) 70,00,000 + 60,000 + 4,000 + 200 + 60 + 9   = [ ]

6. Write the place-value of each underlined digit :

(a) 35,1̲29   = _____   (b) 6̲2,542   = _____

(c) 7,12,43̲6̲   = _____   (d) 4,59,1̲08̲   = _____

(e) 43,1̲7̲,569   = _____   (f) 8̲7̲,56,380   = _____

7. Write in ascending order :

(a) 753; 1,250; 892; 3,186; 1,750; 423

_____

(b) 4,256; 50,183; 7,543; 18,286; 26,432; 13,754

_____

(c) 1,75,289; 28,653; 1,34,250; 2,543; 3,56,730; 18,540

_____

(d) 79,342; 2,54,180; 6,435; 18,726; 54,280; 13,496

_____

8. Write in descending order :

(a) 1,742; 29,400; 15,732; 43,506; 9,832; 36,148

_____

(b) 17,534; 28,567; 32,189; 70,158; 2,56,143; 49,548

_____

(c) 25,193; 65,183; 31,420; 6,543; 51,256; 42,509

_____

(d) 7,54,320; 15,387; 3,10,893; 5,42,568; 72,543; 1,89,720

_____

9. Write the greatest and the smallest numbers using the following digits only once :

Digits	Greatest Numbers	Smallest Numbers
(a) 1, 7, 5	_____	_____
(b) 2, 0, 8	_____	_____
(c) 9, 7, 3	_____	_____
(d) 6, 2, 9	_____	_____
(e) 8, 4, 7	_____	_____
(f) 5, 8, 9	_____	_____

10. Add :

(a)

L	TTh	Th	H	T	O
1	3	5	2	6	1
+ 2	5	6	4	3	8

(b)

L	TTh	Th	H	T	O
2	5	6	7	8	3
+ 4	3	5	2	4	5

(c)

L	TTh	Th	H	T	O
3	5	4	8	7	2
+ 1	8	5	4	8	7

(d)

TL	L	TTh	Th	H	T	O
1	8	7	5	0	2	6
+ 2	5	3	4	2	1	8

(e)

TL	L	TTh	Th	H	T	O
4	1	3	8	5	6	4
+ 1	5	3	4	7	2	9

11. Subtract :

(a)

L	TTh	Th	H	T	O
2	5	6	7	3	5
− 1	3	2	4	5	8

(b)

L	TTh	Th	H	T	O
5	6	8	4	9	7
− 3	2	5	2	5	4

(c)

L	TTh	Th	H	T	O
9	7	0	5	2	8
− 4	5	2	6	5	3

(d)

TL	L	TTh	Th	H	T	O
8	7	2	5	6	3	4
− 3	8	3	4	5	1	8

(e)

TL	L	TTh	Th	H	T	O
6	5	7	3	5	4	9
− 2	5	4	7	3	5	4

12. Multiply :

(a)
```
  1 3 5 4 7
×       2
```

(b)
```
  5 6 2 4 0
×       3
```

(c)
```
  3 1 2 6 4
×       5
```

(d)
```
  2 5 6
×   2 1
```

(e)
```
  1 5 4
×   6 9
```

(f)
```
  4 2 3
×   1 8
```

13. Divide :

(a) 6) 54

(b) 2) 98

(c) 5) 90

(d) 7) 847

(e) 3) 891

(f) 4) 844

14. Find the sum :

(a)

₹	P
2 5	5 0
+ 1 2	2 5

(b)

₹	P
1 6 9	3 2
+ 1 4 2	5 6

(c)

₹	P
6 4 3	1 5 8
+ 2 1 8	4 2 6

(d)

m	cm
1 8	0 6
+ 2 8	4 7

(e)

Km	m
8 9	1 4 2
+ 1 5 3	2 5 6

(f)

Kg	g
1 3 0	2 4 0
+ 1 6 5	1 3 8

15. Find the difference :

(a)

₹	P
2 8	6 0
− 1 5	3 9

(b)

₹	P
7 2	5 0
− 6 3	1 8

(c)

₹	P
1 3 9	5 4
− 2 8	7 2

(d)

m	cm
4 5	2 6
− 1 9	3 7

(e)

l	ml
5 4	1 2 8
− 2 6	1 1 3

(f)

kg	g
6 5 2	4 2 0
− 2 5 4	1 3 4

16. The cost of a chair is ₹ 590. Find the cost of 25 such chairs.

17. In a factory, 1,256 men were working, but at the end of the year 98 men remained in the factory, how many left it?

18. 725 apples are kept equally in 5 baskets. How many apples are kept in each basket?

19. Find the sum :

(a) $\dfrac{3}{5} + \dfrac{2}{5} = \square$

(b) $\dfrac{1}{7} + \dfrac{4}{7} + \dfrac{3}{7} = \square$

(c) $\dfrac{8}{9} + \dfrac{2}{9} + \dfrac{4}{9} = \square$

(d) $\dfrac{7}{8} + \dfrac{3}{8} = \square$

(e) $\dfrac{4}{5} + \dfrac{1}{5} = \square$

(f) $\dfrac{6}{7} + \dfrac{1}{7} + \dfrac{3}{7} = \square$

20. Find the difference :

(a) $\dfrac{8}{9} - \dfrac{5}{9} = \square$

(b) $\dfrac{2}{7} - \dfrac{1}{7} = \square$

(c) $\dfrac{11}{12} - \dfrac{7}{12} = \square$

(d) $\dfrac{9}{11} - \dfrac{8}{11} = \square$

(e) $\dfrac{4}{5} - \dfrac{3}{5} = \square$

(f) $\dfrac{7}{8} - \dfrac{3}{8} = \square$

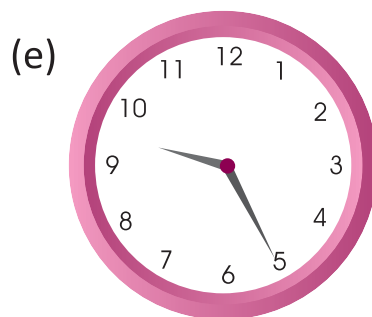21. Look at the figures of the clock and write down the time shown by it :
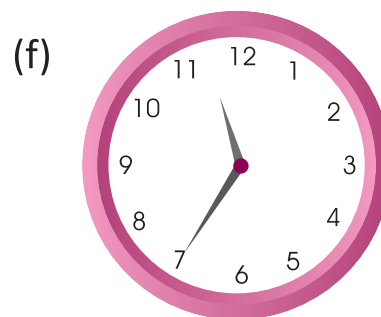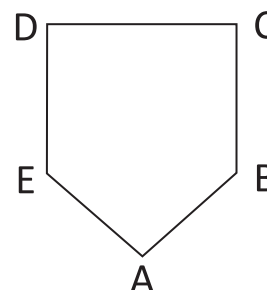
(a)

(b)

(c)

(d)

(e)

(f)
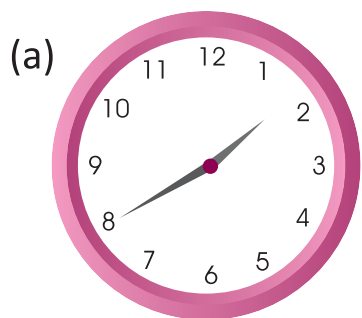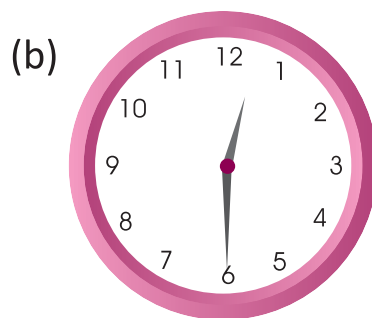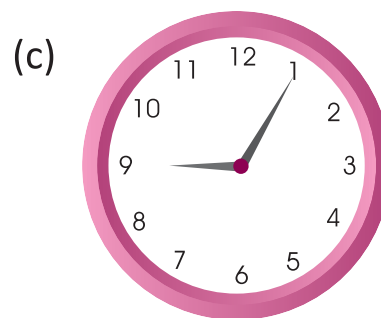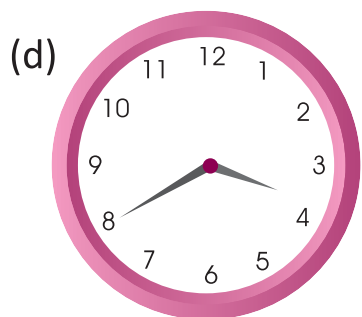
22. Draw a line segment of length 9 cm.

23. Name the line segments in the figure given alongside.

24. Draw the following figures in your notebook :

(a) a triangle (b) a cube (c) a pyramid

(d) a rectangle (e) a cone (f) a cylinder

25. Fill in the blanks :

(a) A triangle has _____ sides.

(b) A cube has _____ surfaces.

(c) A cuboid has _____ vertices.

(d) A cone has _____ plane surface and _____ curved surface.

(e) A cylinder has _____ edges and _____ corner.

(f) A sphere has _____ curved surface and _____ vertex.

Mathematics 3rd

Number Notation

Extension Of Numbers

In the previous class, we have already discussed 6 and 7-digit numbers. To get the next place-value digit, we add '1' to the greatest 7-digit number. So, we have

99,99,999 + 1 = 1,00,00,000, which is one hundred lakh, also called one crore.

Indian Number System

To represent 8-digit numbers in the Indian place-value chart, we have to move to left in it. To understand it, take the number 51426593 and place it in the Indian place-value chart as given below.

CRORES	LAKHS		THOUSANDS		ONES		
C	TL	L	TTh	Th	H	T	O
5	1	4	2	6	5	9	3

5 crores	14 lakhs	26 thousands	5 hundreds 9 tens 3 ones
5,00,00,000	10,00,000 + 4,00,000	20,000 + 6,000	500 + 90 + 3

Word Form : Five crore fourteen lakh twenty six thousand five hundred ninety three

Expanded Form : 5,00,00,000 + 10,00,000 + 4,00,000 + 20,000 + 6,000 + 500 + 90 + 3

In Figures : 5,14,26,593.

Example 1 : Read the following numbers and write them in words :

(a) 54327845   (b) 47513857   (c) 8125427

Also, write the above numerals in a place-value chart form.

Solution : (a) 54327845 = 5,43,27,845

= Five crore forty three lakh twenty seven thousand eight hundred forty five

(b) 47513857 = 4,75,13,857

= Four crore seventy five lakh thirteen thousand eight hundred fifty seven

(c) 8125427 = 81,25,427

= Eighty one lakh twenty five thousand four hundred twenty seven

Place-Value Chart

Numbers	Crores	Ten Lakhs	Lakhs	Ten Thousands	Thou-sands	Hund-reds	Tens	Ones
(a) 54327845	5	4	3	2	7	8	4	5
(b) 47513857	4	7	5	1	3	8	5	7
(c) 8125427		8	1	2	5	4	2	7

International Number System

The British System is called the International System. In this system, only three periods – Ones, Thousands

KEEP IN MIND
- *The greatest 8-digit number is 99999999.*
- *The smallest 8-digit number is 10000000.*

and Millions are used to group the first nine place. These places are grouped in three periods. Here, all the digits of a period are read together and the name of the period (except the ones) is read along with them.

The places in various periods are given below :

MILLIONS			THOUSANDS			ONES		
Hundred-millions (100000000)	Ten-millions (10000000)	Millions (1000000)	Hundred-thousands (100000)	Ten-thousands (10000)	Thousands (1000)	Hundreds (100)	Tens (10)	Ones (1)

Example 2 : Rewrite the following numbers, separating the digits in periods, using the International system of numeration.

(a) 73428543   (b) 6742568   (c) 80602143

Solution : First arrange the given numbers in the International place-value chart.

	MILLIONS			THOUSANDS			ONES		
	HM	TM	M	HTh	TTh	Th	H	T	O
(a)		7	3	4	2	8	5	4	3
(b)			6	7	4	2	5	6	8
(c)		8	0	6	0	2	1	4	3

(a) 73428543 = 73,428,543

= Seventy three million four hundred twenty eight

thousand five hundred forty three

(b) 6742568 = 6,742,568

= Six million seven hundred forty two thousand five
hundred sixty eight

(c) 80602143 = 80,602,143

= Eighty million six hundred two thousand one
hundred forty three

Exercise - 2(A)

1. Arrange the following numerals in Indian palce-value chart and then rewrite them with commas at the right places :
   (a) 5432671   (b) 1085426   (c) 37532148   (d) 42642093
   (e) 67254890   (f) 70084793   (g) 14795625   (h) 31649807

2. Rewrite the following numerals with proper commas, using International place-value chart :
   (a) 13246   (b) 725439   (c) 1856725   (d) 5708348
   (e) 97175473   (f) 63480975   (g) 38742692   (h) 14709725

3. Write the number names of each of the following numeral in the Indian system :
   (a) 725643   (b) 4250189   (c) 75639258   (d) 81434180
   (e) 60810396   (f) 9418297   (g) 34912543   (h) 25429356

4. Write the number names of each of the following numerals in the International system :
   (a) 17542189   (b) 2543872   (c) 7431652   (d) 59134204
   (e) 84324654   (f) 4720956   (g) 95231876   (h) 31820564

5. Express each of the following in Indian place-value chart :
   (a) Sixty five thousand one hundred twenty two

(b) Five lakh eighty two thousand sixty seven

(c) One lakh twenty five

(d) Thirty seven lakh forty thousand three hundred ninety six

(e) Four crore twenty lakh sixty four thousand two hundred fifty five

(f) One crore ninety two lakh five thousand

6. **Express each of the following in International place-value chart :**

(a) Six hundred two thousand five hundred sixty

(b) Nine hundred thousand forty one

(c) One million two hundred seventy five thousand three hundred nine

(d) Four million five hundred six thousand four hundred nine

(e) Twelve million eight hundred seven thousand five hundred forty one

(f) Sixty one million five hundred three thousand nine

TRICKY CHALLENGE

Find how many
(a) 1-digit numbers   (b) 2-digit numbers
(c) 3-digit numbers   (d) 5-digit numbers
(e) 7-digit numbers   (f) 8-digit numbers
exist in our number system.
Do you observe any pattern ? Write, if any.

Face-Value And Place-Value

Every digit in a numeral has two values :

(i) Face-Value   (ii) Place-Value or Local Value

Face-Value : The face-value of a digit in a numeral is the value of the digit itself at whatever place it may be.

Thus, in the numeral 1825406,

The face-value of 6 is 6;   The face-value of 0 is 0;

The face-value of 4 is 4;   The face-value of 5 is 5;

The face-value of 2 is 2;   The face-value of 8 is 8;

The face-value of 1 is 1.

Place-Value : The place-value of a digit depends upon its position it occupies in the number.

It is given by :

Place-Value = Face-Value × Value of the place

For example, in 47368952, 3 is at lakhs place. So, its place-value is given by 3 × 1,00,000, *i.e.,* 3,00,000.

KEEP IN MIND

- *Numbers do not have place-values. The digits in a number have place-values.*
- *Each place in a number has 10 times the value of the place on its right.*
- *Place-value of zero (0) at any place is always 0.*

Example 1 : Find the place-value of all digits in the numeral 8,35,62,174.

Solution :

Digit	Face-value of the digit	Value of the place of the digit	Place-value of the digit
8	8	One crore	8 × one crore = 8,00,00,000
3	3	Ten lakhs	3 × ten lakhs = 30,00,000
5	5	One lakh	5 × one lakh = 5,00,000
6	6	Ten thousands	6 × ten thousands = 60,000
2	2	One thousand	2 × one thousand = 2,000
1	1	One hundred	1 × one hundred = 100
7	7	Tens	7 × tens = 70
4	4	Ones	4 × ones = 4

Expanded Notation

In the above example, we saw the place-value of each digit in the

number 8,35,62,174.

Clearly, 8,35,62,174 can be expressed as :

8,00,00,000 + 30,00,000 + 5,00,000 + 60,000 + 2,000 + 100 +
70 + 4

Which is the expanded form of the number. The numeral 8,35,62,174 is the ordinary or short form.

Example 2 : Write 3,59,18,720 in the expanded form.

Solution : Given numeral may be written as :

C	TL	L	TTh	Th	H	T	O
3	5	9	1	8	7	2	0

So, 3,59,18,720 = 3 crores + 5 ten-lakhs + 9 lakhs + 1 ten-thousand
+ 8 thousands + 7 hundreds + 2 tens + 0 one

$= 3 \times 1,00,00,000 + 5 \times 10,00,000 + 9 \times 1,00,000 + 1 \times 10,000$
$+ 8 \times 1,000 + 7 \times 100 + 2 \times 10 + 0 \times 1$

= 3,00,00,000 + 50,00,000 + 9,00,000 + 10,000 + 8,000 + 700 +
20 + 0

Successor And Predecessor

The number which comes just after a given number is called successor and the number which comes just before a given number is called predecessor.

To get successor, we 'add 1' to the given number and to get predecessor, we 'subtract 1' from the given number.

Example 3 : Find the successor and the predecessor of each of the following numerals :

(a) 74,32,189   (b) 9,52,68,142   (c) 1,28,14,390

Solution : (a) The successor of 74,32,189 = 74,32,189 + 1
= 74,32,190
The predecessor of 74,32,189 = 74,32,189 − 1
= 74,32,188

(b) The successor of 9,52,68,142 = 9,52,68,142 + 1
= 9,52,68,143
The predecessor of 9,52,68,142 = 9,52,68,142 − 1
= 9,52,68,141

(c) The successor of 1,28,14,390 = 1,28,14,390 + 1
= 1,28,14,391
The predecessor of 1,28,14,390 = 1,28,14,390 − 1
= 1,28,14,389

Exercise - 2(B)

1. Write the face-value of each underlined digit in the following numerals :
   (a) 17,42,503   (b) 26,73,186   (c) 7,54,18,725
   (d) 38,75,184   (e) 19,30,425   (f) 1,97,28,432
   (g) 4,50,67,189   (h) 38,187   (i) 7,50,143

2. Write the place-value of each underlined digit in the following numerals :
   (a) 39,24,183   (b) 65,00,183   (c) 1,50,24,687
   (d) 4,30,93,148   (e) 37,56,289   (f) 8,75,18,673
   (g) 7,96,187   (h) 54,79,186   (i) 6,93,50,483

3. Write the following numbers in expanded form :
   (a) 13,54,218   (b) 9,46,508   (c) 3,20,09,143
   (d) 4,73,12,419   (e) 56,30,009   (f) 7,48,19,356
   (g) 1,00,00,285   (h) 4,67,395   (i) 37,54,189

4. Write the successor of each of the following numerals :
   (a) 75,19,380   (b) 4,68,257   (c) 6,72,10,599
   (d) 1,73,42,593   (e) 81,72,009   (f) 3,14,566

(g) 8,96,34,188   (h) 27,59,142   (i) 6,34,560

5.   Write the predecessor of each of the following numerals :

(a) 1,89,320   (b) 6,75,435   (c) 8,99,92,180

(d) 31,56,894   (e) 21,56,488   (f) 7,56,24,399

(g) 2,64,396   (h) 17,45,392   (i) 1,20,56,143

Comparison Of Numbers

To compare any two numbers, steps followed are as under :

Step 1 : Count the number of digits. The number having more digits is greater than the number having less digits.

Step 2 : If the given numbers have same number of digits, start comparing the digits from the left-most position till the digits differ.

Number having greater digit at the respective places will be greater than the number having smaller digit.

Following examples will make the above rules clear.

Example 1 : Which is greater : 15,427 or 3,56,138?

Solution : Clearly 15,427 consists of 5 digits, while 3,56,138 consists of 6 digits.

Since, a number with more digits is greater,

so,   3,56,138 > 15,427

Example 2 : Which is greater : 29,25,183 or 13,54,172 ?

Solution : Both are 7-digit numbers.

Compare their left-most digits, *i.e.*, 2 in 29,25,183 and 1 in 13,54,172.

Since, 2 > 1,

So, 29,25,183 > 13,54,172.

KEEP IN MIND

- '<' *symbol is used for is less than.*
- '>' *symbol is used for is more than.*
- *While reading, using symbols '<' or '>', always starts from left side, as usual we adopt the procedure to read a number.*

Example 3 : Compare 3,50,18,634 and 3,50,29,187.

Solution : Both the numbers have 8 digits, both have the same digits at the crores, ten-lakhs and lakhs places.

So, we compare the digits at ten-thousands place.

This digit is 1 in 3,50,18,634 and 2 in 3,50,29,187 and 1 < 2.

∴ 3,50,18,634 < 3,50,29,187.

Above discussed steps can be used to compare two or more than two numbers and can be kept in two orders, known as :

1. Ascending Order : Numbers are kept from the smallest to the greatest.

2. Descending Order : Numbers are kept from the greatest to the smallest.

Example 4 : Arrange the following numbers in ascending order as well as descending order.

13,42,568; 5,72,51,420; 69,32,485; 10,26,143; 3,15,43,148

Solution : Ascending order :

10,26,143 < 13,42,568 < 69,32,485 < 3,15,43,148
< 5,72,51,420

Descending order :

5,72,51,420 > 3,15,43,148 > 69,32,485 > 13,42,568
> 10,26,143

What Will Be The Next Number?

To find what will be the next number in a series of given numbers, observe the following examples :

(a) 72,546; 72,646; 72,746; 72,846; _____.

On observing the given numbers, we find that digit at hundreds place is increasing, so next number will be 72,946 and next to it will be 73,046.

Hence,

   72,546 ; 72,646 ; 72,746 ; 72,846 ; <u>72,946</u> ; <u>73,046</u>

(b) 57,22,135 ; 57,32,135 ; 57,42,135 ; _____; _____

On observing the given numbers, we find that digit at ten-thousands place is increasing, so, next number will be 57,52,135 and next to it will be 57,62,135.

Hence,

   57,22,135 ; 57,32,135 ; 57,42,135 ; <u>57,52,135</u> ; <u>57,62,135</u>

Exercise - 2(C)

1. Compare the given pairs of numbers and write the appropriate symbol > or < in the boxes :

   (a) 18,325 ☐ 6,945   (b) 93,008 ☐ 93,080

   (c) 1,45,060 ☐ 1,37,183   (d) 5,42,183 ☐ 7,59,642

   (e) 28,43,178 ☐ 17,14,187   (f) 6,39,14,280 ☐ 6,39,67,183

   (g) 17,96,437 ☐ 24,183   (h) 2,40,08,132 ☐ 56,14,720

   (i) 37,158 ☐ 34,149   (j) 17,54,143 ☐ 17,54,109

   (k) 6,75,42,560 ☐ 5,32,14,902   (l) 3,42,54,180 ☐ 7,54,389

2. Arrange in ascending order :

   (a) 40,065; 7,14,725; 31,75,450; 42,54,387; 1,39,450

   (b) 73,145; 89,100; 28,14,364; 7,54,187; 9,38,430

   (c) 3,09,41,206; 2,51,24,183; 8,73,48,142; 5,17,68,142; 1,34,50,257

   (d) 9,54,985; 88,438; 6,03,187; 4,72,409; 9,65,182

   (e) 70,005; 56,75,000; 1,70,050; 2,70,503; 75,050

3. Arrange in descending order :

   (a) 14,069; 7,25,147; 8,57,14,289; 5,60,389; 1,28,436

   (b) 75,24,186; 3,19,428; 61,38,472; 85,74,183; 7,42,507

   (c) 9,25,14,753; 6,42,80,567; 9,30,18,725; 8,75,483; 18,75,147

   (d) 6,38,496; 75,28,147; 92,65,407; 5,46,753; 9,42,286

   (e) 1,20,05,479; 56,89,385; 4,75,389; 9,75,975; 85,74,549

4. Observe the following patterns and write three numerals just after :

(a) 5,313; 5,323; 5,333; _____; _____; _____

(b) 42,56,138; 42,56,140; 42,56,142; _____; _____; _____

(c) 17,049; 17,149; 17,249; _____; _____; _____

(d) 81,13,425; 81,23,425; 81,33,425; _____; _____; _____

(e) 31,56,705; 31,56,710; 31,56,715; _____; _____; _____

Forming Numbers

(A) Forming the smallest number using the given digits only once without repetition.

Case 1 : When none of the given digits is zero. In this case, we arrange the given digits in ascending order.

Examples :

(a) The smallest 3-digit number by using the digits 7,3 and 9 is 379.

(b) The smallest 4-digit number by using the digits 8,2,5 and 9 is 2589.

Case 2 : When one of the given digits is zero.

In this case, we put 0 at second place from the left. We then fill the remaining places form left to right by the remaining digits in an ascending order.

Examples :

(a) The smallest 3-digit number formed by using the digits 0,2 and 8 is 208.

(b) The smallest 4-digit number formed by using the digits 7,5,2 and 0 is 2057.

(B) Forming the greatest number using the given digits only once without repetition :

To form the greatest number, we arrange the given digits in descending order.

Examples :

(a) The greatest 3-digit number formed by using the digits 8,5 and 7 is 875.

(b) The greatest 4-digit number formed by using the digits 7,0,2 and 8 is 8720.

(C) Forming the smallest or greatest number using the given digits, when repetition of digits is allowed :

In this case, first form the smallest or greatest number using the given digits, each only once without repetition. Then in the number so formed, replace the digit whose repetition is allowed, by the number formed by repeating that digit the allowed number of times.

KEEP IN MIND

If the smallest number is to be formed with one of the digits as zero in the number, zero has to be in the second place from the left. Thus if the digit at the left-most place is to be repeated twice, the repeated digits lie on either side of the zero in the second place.

Examples :

(a) The smallest 3-digit number formed by using the digits 2 and 5 and repeating 5 twice, is 255.

(b) The smallest 3-digit number formed by using the digits 7 and 9 repeating 7 twice, is 779.

(c) The smallest 4-digit number formed by using the digits 1,6 and 7 and repeating 7 twice, is 1677.

(d) The smallest 4-digit number formed by using the digits 0, 3 and 9 and repeating 3 twice, is 3039.

(e) The greatest 3-digit number formed by using the digits 5 and 8 and repeating 8 twice, is 885.

(f) The greatest 4-digit number formed by using the digits 3, 5 and 9 and repeating 9 twice, is 9953.

Exercise - 2(D)

1. Write the smallest 3-digit number using each of the following digits only once :

   (a) 3, 8 and 2   (b) 5, 0 and 7   (c) 7, 2, and 5

2. Write the smallest 4-digit number using each of the following digits only once :

   (a) 0, 2, 5 and 8   (b) 7, 2, 5 and 1   (c) 8, 2, 9 and 0

3. Write the greatest 3-digit number using each of the following digits only once :

   (a) 7, 2 and 6   (b) 9, 0 and 3   (c) 2, 5 and 8

4. Write the greatest 4-digit number using each of the following digits only once :

   (a) 1, 7, 9 and 5   (b) 0, 3, 8 and 4   (c) 2, 9, 5 and 8

5. Write the smallest 3-digit number using digits 7 and 5, repeating 7 two times.

6. Write the smallest 3-digit number using digits 0 and 9, repeating 9 two times.

7. Write the smallest 4-digit number using digits 6, 9 and 3, repeating 9 two times.

8. Write the smallest 4-digit number using digits 7, 0 and 6, repeating 6 two times.

9. Write the greatest 4-digit number using digits 6, 4 and 7, repeating 4 two times.

10. Write the greatest 4-digit number using digits 0, 3 and 9, repeating 9 two times.

Review Of The Chapter

1. Arrange the following numerals in Indian place-value chart and then rewrite them with commas at the right places. Also write their number names.

   (a) 672549   (b) 1830563   (c) 4173546   (d) 36754023

2. Arrange the following numerals in International place-value chart and then rewrite them with commas at the right places. Also write their number names :

   (a) 386732   (b) 2542678   (c) 1939745   (d) 87265437

3. Write the place-value of each underlined digit in the following numerals :

   (a) 75,6<u>4</u>,978   (b) 1,78,49,3<u>2</u>0   (c) <u>4</u>,95,178   (d) 25,6<u>0</u>,895

4. Write the successor and the predecessor of each of the following numerals :

   (a) 37,40,299   (b) 1,96,50,285   (c) 7,60,380   (d) 49,38,687

5. Write the following in expanded form :

   (a) 72,56,188   (b) 2,93,487   (c) 1,50,78,196   (d) 8,30,14,119

6. Arrange in ascending order :

   (a) 7,52,178; 35,14,560; 8,54,795; 1,20,348; 25,41,729

   (b) 8,54,675; 4,30,28,145; 75,32,148; 9,54,119; 4,20,15,683

7. Arrange in descending order :

   (a) 3,84,296; 79,10,493; 5,67,183; 25,143; 9,54,183

   (b) 75,24,180; 78,12,420; 5,67,19,385; 4,20,143; 91,56,295

8. Observe the following patterns and fill in the blanks :

   (a) 3,42,150; 3,42,160; 3,42,170; _____; _____

   (b) 4,57,938; 4,67,938.; 4,77,938; _____; _____

   (c) 4,89,380; 5,89,380; 6,89,380; _____; _____

   (d) 1,09,990; 1,09,994; 1,09,998; _____; _____

9. Write the smallest 4-digit number using digits 8, 5 and 6, repeating 8 two times.

10. Write the greatest 4-digit number using digits 0, 5 and 8, repeating 8 two times.

MULTIPLE CHOICE QUESTIONS (MCQs)

1. One crore has :
   (a) 5 zeroes ☐ (b) 6 zeroes ☐ (c) 7 zeroes ☐

2. The smallest 8-digit number is :
   (a) 1,00,00,000 ☐ (b) 9,99,99,999 ☐ (c) None of these ☐

3. One million has :
   (a) 5 zeroes ☐ (b) 6 zeroes ☐ (c) 7 zeroes ☐

4. The place-value of 8 in 7,58,26,341 is :
   (a) 8 ☐ (b) 800 ☐ (c) 8,00,000 ☐

5. The face-value of 2 in 13,46,243 is :
   (a) 2 ☐ (b) 20 ☐ (c) 200 ☐

6. The number name of 1,00,00,009 is :
   (a) One nine ☐ (b) One lakh nine ☐ (c) One crore nine ☐

7. The number name of 23,640,832 according to international place-value system is :
   (a) Two crore thirty six lakh forty thousand eight hundred thirty two ☐
   (b) Twenty three million six hundred forty thousand eighty hundred thirty two ☐
   (c) None of these ☐

8. The smallest number using the digits 3, 6 and 4 is :
   (a) 346 ☐ (b) 643 ☐ (c) 364 ☐

9. The greatest 4-digit number using the digits 0, 3, 1 and 6 is :
   (a) 3016 ☐ (b) 6310 ☐ (c) 1036 ☐

10. The greatest 4-digit number using the digits 2, 5 and 3, repeating 5 two times is :
    (a) 2553 ☐ (b) 5532 ☐ (c) 5523 ☐

11. The smallest 3-digit number using 2 and 5, repeating 5 two times is :
    (a) 255 ☐ (b) 525 ☐ (c) 552 ☐

Mathematics 3rd

Addition

Addition Of Large Numbers

Adding large numbers is the same as adding smaller numbers. Thus, for adding large numbers, first arrange the numbers in columns as per their place-values and then carry out addition starting from ones column.

To understand it, look into the following examples :

Addition Without Carrying

Example 1 : Add 38,74,354 and 21,23,411.

Solution : Arrange the given numbers in the proper columns.

TL	L	TTh	Th	H	T	O	
3	8	7	4	3	5	4	← Addend
+ 2	1	2	3	4	1	1	← Addend
5	9	9	7	7	6	5	← Sum

Adding ones ; 4 + 1 = 5 ones

Adding tens ; 5 + 1 = 6 tens

Adding hundreds ; 3 + 4 = 7 hundreds

Adding thousands ; 4 + 3 = 7 thousands

Adding ten-thousands ; 7 + 2 = 9 ten-thousands

Adding lakhs ; 8 + 1 = 9 lakhs

Adding ten-lakhs ; 3 + 2 = 5 ten-lakhs

Hence, 38,74,354 + 21,23,411 = 59,97,765.

Example 2 : Find the sum of 1,24,32,506; 2,31,41,253 and 1,32,13,240.

Solution : Arrange the given numbers in the proper columns.

C	TL	L	TTh	Th	H	T	O
1	2	4	3	2	5	0	6
+ 2	3	1	4	1	2	5	3
+ 1	3	2	1	3	2	4	0
4	8	7	8	6	9	9	9

$6 + 3 + 0 = 9$ ones

$0 + 5 + 4 = 9$ tens

$5 + 2 + 2 = 9$ hundreds

$2 + 1 + 3 = 6$ thousands

$3 + 4 + 1 = 8$ ten-thousands

$4 + 1 + 2 = 7$ lakhs

$2 + 3 + 3 = 8$ ten-lakhs

$1 + 2 + 1 = 4$ crores

Hence, $1,24,32,506 + 2,31,41,253 + 1,32,13,240 = 4,87,86,999$

Exercise - 3(A)

1. Add :

(a)

TL	L	TTh	Th	H	T	O
2	5	6	0	8	1	3
+ 3	4	2	3	1	2	5

(b)

TL	L	TTh	Th	H	T	O
1	6	5	3	4	2	1
+ 2	2	1	4	5	0	3

(c)

TL	L	TTh	Th	H	T	O
5	3	8	2	4	1	3
+ 3	2	1	4	2	3	4

(d)

TL	L	TTh	Th	H	T	O
3	8	7	4	3	1	4
+ 2	1	0	3	2	6	4

(e)

TL	L	TTh	Th	H	T	O
4	3	2	5	6	0	9
+ 5	5	4	3	1	5	0

(f)

TL	L	TTh	Th	H	T	O
7	4	2	6	3	8	1
+ 2	3	1	2	6	0	5

(g)

C	TL	L	TTh	Th	H	T	O
8	3	4	5	1	3	2	4
+ 1	2	3	2	4	3	2	1

(h)

C	TL	L	TTh	Th	H	T	O
5	6	4	3	2	1	8	5
+ 1	2	3	5	2	4	1	3

(i)

C	TL	L	TTh	Th	H	T	O
6	3	6	2	4	3	1	7
+ 2	1	3	4	5	3	2	2

(j)

C	TL	L	TTh	Th	H	T	O
7	2	3	6	5	2	4	1
+ 1	5	2	0	1	4	3	2

(k)

C	TL	L	TTh	Th	H	T	O
2	4	3	6	3	5	1	8
+ 1	2	4	1	2	1	3	0
+ 2	1	2	1	2	3	2	1

(l)

C	TL	L	TTh	Th	H	T	O
4	2	5	3	9	6	2	1
+ 3	2	1	2	0	1	3	2
+ 1	3	1	3	0	2	1	4

2. Find the sum of :

(a) 24,33,125 and 13,42,234

(b) 19,25,326 and 30,42,132

(c) 1,32,41,240 and 2,41,35,324

(d) 2,75,32,186 and 3,23,42,213

(e) 12,56,349; 23,21,210 and 21,12,210

(f) 30,12,432; 15,24,123 and 33,42,341

Addition With Carrying

Example 1 : Add 35,68,139 and 28,34,287.

Solution : Arrange the given numbers in the proper columns.

TL	L	TTh	Th	H	T	O
1	1	1			1	1
3	5	6	8	1	3	9
+ 2	8	3	4	2	8	7
6	4	0	2	4	2	6

Steps :

1. Adding ones : $9 + 7 = 16$ ones = $\boxed{1}$ ten + 6 ones
   Write 6 in ones column.

2. Adding tens : $3 + 8 + \boxed{1} = 12$ tens = $\boxed{1}$ hundred + 2 tens
   Write 2 in tens column.

3. Adding hundreds : $1 + 2 + \boxed{1} = 4$ hundreds
   Write 4 in hundreds column.

4. Adding thousands : $8 + 4 = 12$ thousands
                    = $\boxed{1}$ ten-thousand + 2 thousands
   Write 2 in thousands column.

5. Adding ten-thousands : $6 + 3 + \boxed{1} = 10$ ten-thousands
                        = $\boxed{1}$ lakh + 0 ten-thousand
   Write 0 in ten thousands column.

6. Adding lakhs : $5 + 8 + \boxed{1} = 14$ lakhs
                = $\boxed{1}$ ten-lakh + 4 lakhs
   Write 4 in lakhs column.

7. Adding ten-lakhs : $3 + 2 + \boxed{1} = 6$ ten-lakhs
   Write 6 in ten-lakhs column.

Example 2 : Find the sum of 2,35,18,725; 1,43,86,139 and 4,35,19,560.

Solution : Arrange the given numbers in the proper columns.

C	TL	L	TTh	Th	H	T	O
1	1	1	2	1	1	1	
2	3	5	1	8	7	2	5
+ 1	4	3	8	6	1	3	9
+ 4	3	5	1	9	5	6	0
8	1	4	2	4	4	2	4

$5 + 9 + 0 = 14 = \boxed{1}4$

$2 + 3 + 6 + \boxed{1} = 12 = \boxed{1}2$

$7 + 1 + 5 + \boxed{1} = 14 = \boxed{1}4$

$8 + 6 + 9 + \boxed{1} = 24 = \boxed{2}4$

$1 + 8 + 1 + \boxed{2} = 12 = \boxed{1}2$

$5 + 3 + 5 + \boxed{1} = 14 = \boxed{1}4$

$3 + 4 + 3 + \boxed{1} = 11 = \boxed{1}1$

$2 + 1 + 4 + \boxed{1} = 8$

Hence, 2,35,18,725 + 1,43,86,139 + 4,35,19,560 = 8,14,24,424.

Exercise - 3(B)

1. Add :

(a)

TL	L	TTh	Th	H	T	O
1	3	2	5	6	4	7
+ 7	5	4	3	2	5	6

(b)

TL	L	TTh	Th	H	T	O
2	4	5	6	4	8	3
+ 3	5	6	7	3	8	7

(c)

TL	L	TTh	Th	H	T	O
3	6	9	8	7	5	4
+ 2	3	4	5	6	3	8

(d)

TL	L	TTh	Th	H	T	O
5	6	7	8	9	3	2
+ 2	3	4	5	4	6	8

(e)

TL	L	TTh	Th	H	T	O
4	5	6	7	8	3	4
+ 2	5	8	3	4	7	9

(f)

TL	L	TTh	Th	H	T	O
6	8	3	4	5	7	5
+ 1	5	9	6	8	2	7

(g)

C	TL	L	TTh	Th	H	T	O
3	8	5	4	2	5	6	7
+ 4	1	5	3	8	9	7	5

(h)

C	TL	L	TTh	Th	H	T	O
5	6	7	8	3	9	4	7
+ 2	2	5	4	8	7	5	4

(i)

C	TL	L	TTh	Th	H	T	O
3	4	5	6	7	8	9	3
+ 5	2	7	5	4	9	3	8

(j)

C	TL	L	TTh	Th	H	T	O
2	5	6	8	9	3	4	2
+ 1	4	7	5	4	5	6	7

(k)

C	TL	L	TTh	Th	H	T	O
1	3	5	4	2	5	6	7
+ 2	5	4	3	8	6	7	5
+ 3	1	4	5	6	7	2	9

(l)

C	TL	L	TTh	Th	H	T	O
2	9	5	3	4	6	7	2
+ 1	5	3	8	7	2	4	6
+ 3	4	3	2	5	6	7	8

2. Find the sum of :

(a) 25,67,389 and 14,56,426

(b) 72,53,147 and 12,57,286

(c) 3,42,58,143 and 2,56,28,175

(d) 1,38,47,568 and 3,46,75,394

(e) 32,56,747; 16,37,834 and 25,47,354

(f) 2,55,72,186; 5,37,43,257 and 1,43,56,298
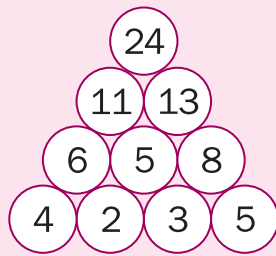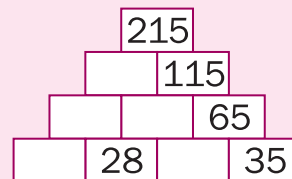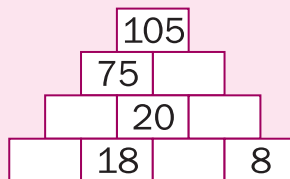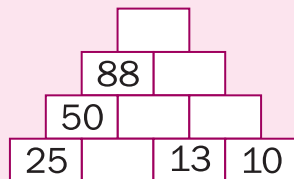
Properties Of Addition

1. Order Property Of Addition

Example 1 :   Find the sum : 25,42,165 + 15,36,243.

Also, find the sum : 15,36,243 + 25,42,165

What do you observe?

Solution :

TL	L	TTh	Th	H	T	O
1				1		
2	5	4	2	1	6	5
+ 1	5	3	6	2	4	3
4	0	7	8	4	0	8

TL	L	TTh	Th	H	T	O
1				1		
1	5	3	6	2	4	3
+ 2	5	4	2	1	6	5
4	0	7	8	4	0	8

Hence, 25,42,165 + 15,36,243 = 15,36,243 + 25,42,165

= 40,78,408.

Thus, we observe that :

The sum of two numbers does not change when the order of the addends is changed. This is called the order property of addition.

2. Grouping Property Of Addition

Example 2 : Find the sum : (35,14,264 + 12,35,186) + 28,13,576

Also, find the sum : 35,14,264 + (12,35,186 + 28,13,576)

What do you observe?

Solution :

(35,14,264 + 12,35,186) + 28,13,576

We have :

TL	L	TTh	Th	H	T	O
					[1]	[1]
3	5	1	4	2	6	4
+ 1	2	3	5	1	8	6
4	7	4	9	4	5	0

35,14,264 + 12,35,186
= 47,49,450

TL	L	TTh	Th	H	T	O
	[1]		[1]	[1]	[1]	
4	7	4	9	4	5	0
+ 2	8	1	3	5	7	6
7	5	6	3	0	2	6

(35,14,264 + 12,35,186)
+ 28,13,576
= 47,49,450 + 28,13,576
= 75,63,026

Now,

35,14,264 + (12,35,186 + 28,13,576)

We have :

TL	L	TTh	Th	H	T	O
[1]				[1]	[1]	
1	2	3	5	1	8	6
+ 2	8	1	3	5	7	6
4	0	4	8	7	6	2

12,35,186 + 28,13,576
= 40,48,762

TL	L	TTh	Th	H	T	O
			[1]	[1]	[1]	
3	5	1	4	2	6	4
+ 4	0	4	8	7	6	2
7	5	6	3	0	2	6

35,14,264 + (12,35,186
+ 28,13,576) = 75,63,026

Hence, (35,14,264 + 12,35,186) + 28,13,576
= 35,14,264 + (12,35,186 + 28,13,576)

Thus, we observe that :

The sum of three or more numbers does not change even when their grouping is changed. This is known as the grouping property of addition.

3. Additive Property Of Zero

Example 3 : Find the sums : 35,19,426 + 0 and 0 + 35,19,426. What do you observe?

Solution :

TL	L	TTh	Th	H	T	O
3	5	1	9	4	2	6
+						0
3	5	1	9	4	2	6

TL	L	TTh	Th	H	T	O
						0
+ 3	5	1	9	4	2	6
3	5	1	9	4	2	6

Hence, 35,19,426 + 0 = 0 + 35,19,426

Thus, we observe that :

The sum of a number and 0 is the number itself.

Exercise - 3(C)

Using the properties of addition, fill in the blanks :

1. 72,35,143 + 11,568 = _____ + 72,35,143

2. 56,31,290 + _____ = 11,38,540 + 56,31,290

3. _____ + 17,46,252 = 26,72,387 + 17,46,252

4. (10,392 + 27,475) +10,00,281 = 10,392 + (27,475 + _____)

5. 40,000 + (28,000 + 10,000) = (40,000 + 28,000) + _____

6. 17,25,463 + (14,225 + 10,053) = (_____ + 14,225) + 10,053

7. _____ + 42,30,567 = 42,30,567

8. _____ + 0 = 17,963

9. 28,356 + 0 = _____

10. 0 + _____ = 49,348

Word Problems Based On Addition

Example 1 : The cost of a bike is ₹ 75,569, the cost of a car is ₹ 5,64,385 and the cost of a scooty is ₹ 35,496. Find their total cost.

Solution : The cost of a bike = ₹ 75,569

The cost of a car = ₹ 5,64,385

The cost of a scooty = ₹ 35,496

```
  1 1 1 2 2
    7 5 5 6 9
    5 6 4 3 8 5
  + 3 5 4 9 6
    6 7 5 4 5 0
```

Their total cost = ₹ 75,569 + ₹ 5,64,385 + ₹ 35,496

= ₹ 6,75,450

Thus, the total cost of these vehicles is ₹ 6,75,450.

Example 2 : There are 5,63,427 men, 4,57,115 women and 2,59,075 children in a city. What is the population of that city?

Solution : Number of men in the city = 5,63,427

Number of women in the city = 4,57,115

Number of children in the city = 2,59,075

Total population of the city = 5,63,427 + 4,57,115 + 2,59,075

= 12,79,617

Hence, the total population of the city is 12,79,617.

```
  1 1   1 1
  5 6 3 4 2 7
  4 5 7 1 1 5
+ 2 5 9 0 7 5
1 2 7 9 6 1 7
```

Exercise - 3(D)

1. A company made 1,75,296 trucks and 95,297 scooters in one year. How many number of vehicles were made altogether in that year?

2. The number of persons who visited Amritsar Gurudwara during last 2 weeks

was 79,32,480 and 81,56,195 respectively. How many total people visited the shrine during these two weeks?

3. In an election, there were four candidates. They received 48,590; 37,947; 75,405 and 21,041 votes respectively. How many votes in all, were polled?

4. In a public library, there are 94,286 books on literature, 39,047 books on mathematics and 28,967 books on other subjects. Find the total number of books in the library.

5. A number exceeds 8,76,53,472 by 32,54,153. What is the number?

6. Mr. Nitin Kapoor travelled a distance of 97,542 km by car, 64,329 km by train and 1,57,946 km by bus. Find the total distance travelled by him?

7. In a certain year, three sugar factories produced 17,569; 28,095 and 96,387 bags of sugar respecitvely. What is the total number of bags produced?

8. Three ropes are 28,945 metres, 16,795 metres and 50,006 metres in length respectively. What is the total length of these ropes?

9. A house was made using 2,56,185 bricks. Another house was made using 1,28,390 bricks. How many bricks were used in all?

10. An auto company sold 42,598 two-wheelers in January and 39,564 in February. In all how many two-wheelers did it sell in these two months?

Review Of The Chapter

1. Add :

(a)

TL	L	TTh	Th	H	T	O
5	6	3	2	5	4	2
+ 1	3	4	2	4	3	5

(b)

TL	L	TTh	Th	H	T	O
3	5	4	7	8	3	4
+ 1	2	5	6	7	8	7

(c)

C	TL	L	TTh	Th	H	T	O
1	8	9	3	5	4	7	6
+ 3	4	5	2	6	3	4	2

(d)

C	TL	L	TTh	Th	H	T	O
5	4	3	2	5	4	2	5
+ 3	6	5	4	7	3	1	3

2. Find the sum of :

(a) 2,56,15,143 and 4,53,12,296

(b) 15,74,387 and 29,56,419

(c) 14,57,283; 15,49,380 and 26,56,315

(d) 29,34,157; 18,35,468 and 20,54,389

3. Fill in the blanks :

(a) 34,18,725 + _____ = 14,56,720 + 34,18,725

(b) 5,63,421 + 13,356 = _____ + 5,63,421

(c) 9,15,32,456 + 0 = _____

(d) _____ + 0 = 75,28,145

4. The population of a town was 5,38,420 two years ago. It has increased by 6,12,560 since then. What is the total population of this town now?

5. A company sold 18,396 televisions in first year, 32,286 televisions in second year and 39,187 televisions in third year. How many televisions did it sell in the three years taken together?'

6. Find the sum of the greatest 5-digit number, the greatest 6-digit number and the smallest 7-digit number.

MULTIPLE CHOICE QUESTIONS (MCQs)

1. The numbers to be added are called :

(a) Addends ☐ (b) Sum ☐ (c) None of these ☐

2. The result obtained after adding is called :

(a) Addends ☐ (b) Sum ☐ (c) None of these ☐

3. Which of the following problems shows the order property of addition?

(a) 1,582 + 0 = 1,582 ☐

(b) 2,932 + 1,465 = 1,465 + 2,932 ☐

(c) None of these ☐

4. Which of the following problems shows the additive property of zero?

(a) 2,954 + 1,296 = 1,296 + 2,954 ☐

(b) (1,342 + 1,150) + 2,543 = 1,342 + (1,150 + 2,543) ☐

(c) 1,672 + 0 = 1,672 ☐

5. Which of the following problems shows the grouping property of addition?

(a) 1,475 + 1,432 = 1,432 + 1,475 ☐

(b) (2,953 + 4,264) + 1,859 = 2,953 + (4,264 + 1,859) ☐

(c) 4,675 + 0 = 4,675 ☐

6. The number which is 10,000 more than 89,492 is :

(a) 89,592 ☐   (b) 99,492 ☐   (c) 90,492 ☐

7. A number exceeds 4,27,888 by 15,320. What is that number ?

(a) 4,43,208 ☐   (b) 4,12,568 ☐   (c) None of these ☐

8. In an examination, 89,326 students passed. If the number of failures be 29,547, the number of students who appeared in the examination is :

(a) 59,779 ☐   (b) 1,18,873 ☐   (c) None of these ☐

9. What number should be added to the greatest 7-digit number to get the smallest 8-digit number?

(a) 1 ☐   (b) 10 ☐   (c) 100 ☐

10. 9 lakhs = _____ ten-thousands.

(a) 9 ☐   (b) 90 ☐   (c) 900 ☐

11. In 34,65,129 + 12,72,143 = 47,37,272 the addends are :

(a) 34,65,129 ☐

(b) 12,72,143 and 34,65,129 ☐

(c) 47,37,272 ☐

12. In 15,72,420 + 10,56,243 = 26,28,663 the sum is :

(a) 15,72,420 ☐   (b) 10,56,243 ☐   (c) 26,28,663 ☐

Subtraction

Subtraction Of Large Numbers

The method of subtracting two large numbers is same as that for smaller numbers.

In a subtraction problem, we use the following terms :

The larger number from which we subtract the other number, is known as minuend.

The number which is subtracted is called subtrahend. The result of subtraction is called the difference between the given numbers.

Subtraction Without Borrowing

Example 1 : Subtract 32,57,183 from 96,88,497.

Solution : Arrange the given numbers in the proper columns.

TL	L	TTh	Th	H	T	O	
9	6	8	8	4	9	7	← Minuend
– 3	2	5	7	1	8	3	← Subtrahend
6	4	3	1	3	1	4	← Difference

Subtracting ones ; 7 – 3 = 4 ones

Subtracting tens ; 9 – 8 = 1 ten

Subtracting hundreds ; 4 – 1 = 3 hundreds

Subtracting thousands ; 8 – 7 = 1 thousand

Subtracting ten-thousands ; 8 – 5 = 3 ten-thousands

Subtracting lakhs ; 6 – 2 = 4 lakhs

Subtracting ten-lakhs ; 9 – 3 = 6 ten-lakhs

Hence, 96,88,497 – 32,57,183 = 64,31,314.

Example 2 : Find the difference between 5,46,75,435 and 9,87,86,847.

Solution : In the above numbers, 9,87,86,847 is the minuend and 5,46,75,735 is the subtrahend.

C	TL	L	TTh	Th	H	T	O
9	8	7	8	6	8	4	7
− 5	4	6	7	5	4	3	5
4	4	1	1	1	4	1	2

7 – 5 = 2 ones

4 – 3 = 1 ten

8 – 4 = 4 hundreds

6 – 5 = 1 thousand

8 – 7 = 1 ten-thousand

7 – 6 = 1 lakh

8 – 4 = 4 ten-lakhs

9 – 5 = 4 crores

Hence, 9,87,86,847 – 5,46,75,435 = 4,41,11,412.

Exercise - 4(A)

1. Subtract :

(a)
TL	L	TTh	Th	H	T	O
8	5	4	7	5	4	2
− 2	3	2	1	4	3	1

(b)
TL	L	TTh	Th	H	T	O
3	8	7	4	3	1	4
− 2	1	0	3	2	0	4

(c)	TL	L	TTh	Th	H	T	O
	5	4	3	8	7	5	6
−	2	1	2	5	3	4	2

(d)	TL	L	TTh	Th	H	T	O
	7	8	9	6	5	4	2
−	3	5	8	2	3	1	0

(e)	TL	L	TTh	Th	H	T	O
	9	8	7	4	6	2	5
−	3	4	5	2	1	2	4

(f)	TL	L	TTh	Th	H	T	O
	4	6	7	3	2	5	9
−	2	3	6	2	1	4	3

(g)	C	TL	L	TTh	Th	H	T	O
	4	8	3	2	1	5	7	4
−	3	6	2	1	1	4	3	2

(h)	C	TL	L	TTh	Th	H	T	O
	9	4	5	3	2	8	6	4
−	2	3	4	2	1	7	2	3

(i)	C	TL	L	TTh	Th	H	T	O
	2	4	7	5	8	7	4	6
−	1	3	6	4	6	3	2	3

(j)	C	TL	L	TTh	Th	H	T	O
	8	7	4	7	5	8	9	6
−	3	2	3	1	4	7	5	4

(k)	C	TL	L	TTh	Th	H	T	O
	7	6	5	4	3	2	6	8
−	2	3	4	3	1	2	4	3

(l)	C	TL	L	TTh	Th	H	T	O
	9	3	6	4	5	6	4	3
−	2	1	5	2	4	3	2	1

2. Find the difference between :

(a) 79,28,386 and 16,14,253

(b) 54,17,249 and 32,16,132

(c) 8,36,14,295 and 7,24,03,183

(d) 3,97,87,496 and 2,56,13,325

(e) 4,25,48,342 and 3,14,34,131

(f) 29,87,565 and 18,56,432

Subtraction With Borrowing

Example 1 : Subtract 32,56,893 from 91,32,754.

Solution : Arrange the given numbers in the proper columns.

TL	L	TTh	Th	H	T	O
8	10	12	11	16	15	
9	1	3	2	7	5	4
− 3	2	5	6	8	9	3
5	8	7	5	8	6	1

Steps :

1. Subtracting ones : 4 ones – 3 ones = 1 one.

   Write 1 in ones column.

2. We can't subtract 9 tens from 5 tens as 5 < 9.

   We borrow 1 hundred from hundreds column.

   5 tens + 1 hundred = 5 tens + 10 tens = 15 tens.

   Now, 15 tens – 9 tens = 6 tens.

   Write 6 in tens column leaving behind 6 in hundreds column.

3. We can't subtract 8 hundreds from 6 hundreds, as 6 < 8.

   We borrow 1 thousand from thousands column.

   6 hundreds + 1 thousand = 6 hundreds + 10 hundreds = 16 hundreds.

   Now, 16 hundreds – 8 hundreds = 8 hundreds.

   Write 8 in hundreds column leaving behind 1 in thousands column.

4. We can't subtract 6 thousands from 1 thousand as 1 < 6.

   We borrow 1 ten-thousand from ten-thousands column.

   1 thousand + 1 ten-thousand = 1 thousand + 10 thousands

   = 11 thousands.

   Now, 11 thousands – 6 thousands = 5 thousands.

   Write 5 in thousands column leaving behind 2 in ten-thousands column.

5. We can't subtract 5 ten-thousands from 2 ten-thousands as 2 < 5.
   We borrow 1 lakh from lakhs column.

   2 ten-thousands + 1 lakh = 2 ten-thousands + 10 ten-thousands
   $\qquad\qquad\qquad\qquad\qquad\quad$ = 12 ten-thousands.

   Now, 12 ten-thousands – 5 ten-thousands = 7 ten-thousands.

   Write 7 in ten-thousands column leaving behind 0 in lakhs column.

6. We can't subtract 2 from 0 as 0 < 2.
   We borrow 1 ten-lakh from ten-lakhs column.

   0 lakh + 1 ten-lakh $\quad$ = 0 + 10 lakhs.
   $\qquad\qquad\qquad\qquad$ = 10 lakhs.

   Now, 10 lakhs – 2 lakhs = 8 lakhs.

   Write 8 in lakhs column leaving behind 8 in ten-lakhs column.

7. Subtracting ten-lakhs : 8 ten-lakhs – 3 ten lakhs = 5 ten lakhs.
   Write 5 in ten-lakhs column.

   Hence, 91,32,754 – 32,56,893 = 58,75,861.

Example 2 : Find the difference between 8,25,36,402 and 64,38,197.

Solution : Arrange the given numbers in the proper columns.

C	TL	L	TTh	Th	H	T	O
7	12	4	12	16	3	9	12
8	2	5	3	6	4	0	2
–	6	4	3	8	1	9	7
7	6	0	9	8	2	0	5

Hence, 8,25,36,402 – 64,38,197 = 7,60,98,205.

Exercise - 4(B)

1. Subtract :

(a)
TL	L	TTh	Th	H	T	O
3	6	5	4	2	8	7
− 1	2	7	6	4	3	9

(b)
TL	L	TTh	Th	H	T	O
9	3	4	2	1	5	3
− 6	5	8	7	4	6	7

(c)
TL	L	TTh	Th	H	T	O
7	3	8	9	5	0	0
− 2	4	6	7	8	7	5

(d)
TL	L	TTh	Th	H	T	O
8	3	0	5	2	6	4
− 5	1	2	4	7	3	9

(e)
TL	L	TTh	Th	H	T	O
5	6	8	4	2	7	1
− 1	5	6	8	7	9	4

(f)
TL	L	TTh	Th	H	T	O
6	8	4	2	7	5	3
− 2	5	6	7	4	3	1

(g)
C	TL	L	TTh	Th	H	T	O
8	4	3	2	5	4	6	7
− 2	5	6	8	7	9	3	2

(h)
C	TL	L	TTh	Th	H	T	O
7	5	4	3	2	5	6	9
− 2	4	3	4	5	6	7	8

(i)
C	TL	L	TTh	Th	H	T	O
6	4	7	2	8	0	0	9
− 4	5	3	6	7	9	8	5

(j)
C	TL	L	TTh	Th	H	T	O
4	9	8	4	6	5	0	7
− 2	3	9	6	7	8	2	5

(k)
C	TL	L	TTh	Th	H	T	O
7	4	6	8	0	5	2	1
− 3	2	4	9	7	3	6	4

(l)
C	TL	L	TTh	Th	H	T	O
8	2	6	5	4	7	5	7
− 3	5	9	7	8	6	2	8

2. Find the difference between :

(a) 72,85,367 and 49,50,648

(b) 60,54,598 and 12,67,254

(c) 38,19,425 and 27,14,756

(d) 90,09,986 and 75,18,792

(e) 4,56,39,284 and 3,45,79,196   (f) 5,47,96,189 and 2,56,28,420

To Check Subtraction

Example 1 : Subtract 43,65,289 from 95,72,164 and verify the answer.

Solution : Here, 95,72,164 is the minuend and 43,65,289 is the subtrahend.

Arrange the minuend and subtrahend as shown alongside.

TL	L	TTh	Th	H	T	O
		6	11	10	15	14
9	5	7	2	1	6	4
− 4	3	6	5	2	8	9
5	2	0	6	8	7	5

Hence, the required difference is 52,06,875.

Verification :

To verify the answer, we add the difference to the subtrahend, and get the minuend.

Difference $\longrightarrow$
Subtrahend $\longrightarrow$

```
  5 2 0 6 8 7 5
+ 4 3 6 5 2 8 9
  9 5 7 2 1 6 4  ←—— Minuend
```

Hence, the answer is verified.

Example 2 : Find the difference between 9,45,28,653 and 4,56,93,186 and verify the answer.

Solution :

C	TL	L	TTh	Th	H	T	O
8	13	14	12		5	14	13
9	4	5	2	8	6	5	3	←—— Minuend
−4	5	6	9	3	1	8	6	←—— Subtrahend
4	8	8	3	5	4	6	7	←—— Difference

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Verification :

Difference ⟶
Subtrahend ⟶

$$\begin{array}{r} 4\,8\,8\,3\,5\,4\,6\,7 \\ +\ 4\,5\,6\,9\,3\,1\,8\,6 \\ \hline 9\,4\,5\,2\,8\,6\,5\,3 \end{array}$$ ⟵ Minuend

Hence, the answer is verified.

Exercise - 4(C)

Find the difference and verify the answer of each of the following :

1. 25,75,386 – 12,49,135
2. 47,56,187 – 38,49,256
3. 5,43,12,745 – 3,64,13,425
4. 6,83,75,250 – 3,42,16,789
5. 7,95,42,187 – 2,86,47,296
6. 9,35,42,187 – 2,56,54,396
7. 84,79,183 – 35,96,942
8. 56,35,425 – 36,18,729
9. 63,18,005 – 24,15,396
10. 77,49,316 – 28,15,347

Word Problems Based On Subtraction

Example 1 : The sum of two numbers is 50,38,756. If one of the numbers is 39,56,124, find the other number.

Solution : The sum of two numbers = 50,38,756

One number = 39,56,124

∴ The other number

$$\begin{array}{r} \boxed{9}\ \boxed{13} \\ 5\,0\,3\,8\,7\,5\,6 \\ -\ 3\,9\,5\,6\,1\,2\,4 \\ \hline 1\,0\,8\,2\,6\,3\,2 \end{array}$$

   = 50,38,756 – 39,56,124

   = 10,82,632.

Hence, the other number is 10,82,632.

Example 2 : A company sold 25,65,380 televisions this year. Last year, they had sold 18,39,657 televisions. How many more televisions did they sell this year?

Solution : Number of televisions sold this year = 25,65,380

Number of televisions sold last year = 18,39,657

The extra number of televisions sold this year

$$= 25,65,380 - 18,39,657$$

$$= 7,25,723$$

Hence, they sold 7,25,723 more televisions this year.

1	15	5	14	13	7	10
2	5	6	5	3	8	0
− 1	8	3	9	6	5	7
0	7	2	5	7	2	3

Exercise - 4(D)

1. The population of a town is 5,65,286. If 2,48,397 are males, find the number of females in that town.

2. A garrison had 52,675 soldiers. Out of this 18,357 soldiers were ordered to go to the border. How many soldiers are left in the garrison now?

3. A shopkeeper had 5,63,289 kg of sugar. He sold out 52,496 kg sugar in two days. How much sugar was left in the stock after the sold sales in two days?

4. The sum of two numbers is 6,59,387. If one of them is 3,42,687, find the other.

5. Find the difference between 63,28,564 and the number formed by reversing the digits of the given number.

6. A trade fair had 42,567 visitors in the first year and 65,873 in the second year. How many more people visited the trade fair in the second year?

7. Till last year, a car had covered 42,657 km. Now its odometer reads 73,496 km. How many kilometres did the car travel in past one year?

8. In an all India examination, 4,75,21,386 candidates appeared. Out of these, 16,25,796 failed. How may candidates passed?

9. A milk dairy produced 82,500 litres of milk in a day. It supplied 67,425 litres to a town. How much milk was left with the dairy on that day?

10. What must be added to 24,79,187 to get 58,34,156?

Addition And Subtraction Together

Example 1 : Simplify : 34,24,108 + 15,72,543 – 6,29,187.

Solution :

Step I

TL	L	TTh	Th	H	T	O
					1	
3	4	2	4	1	0	8
+1	5	7	2	5	4	3
4	9	9	6	6	5	1

Step II

TL	L	TTh	Th	H	T	O
		8	16	5	14	11
4	9	9	6	6	5	1
–	6	2	9	1	8	7
4	3	6	7	4	6	4

Hence, 34,24,108 + 15,72,543 – 6,29,187

= 43,67,464.

Example 2 : Simplify : 3,12,546 – 48,542 + 6,72,429 – 1,03,425.

Solution :

Step I

L	TTh	Th	H	T	O
2	10	12			
3	1	2	5	4	6
–	4	8	5	4	2
2	6	4	0	0	4

Step II

L	TTh	Th	H	T	O
1				1	
2	6	4	0	0	4
+6	7	2	4	2	9
9	3	6	4	3	3

Step III

L	TTh	Th	H	T	O
				2	13
9	3	6	4	3	3
–1	0	3	4	2	5
8	3	3	0	0	8

Hence, 3,12,546 – 48,542 + 6,72,429 – 1,03,425 = 8,33,008.

Exercise - 4(E)

Simplify :

1. 2,54,756 + 2,14,386 – 48,295

2. 49,342 – 31,645 + 89,343

3. 16,73,254 – 28,436 + 3,42,569

4. 6,00,142 + 2,34,496 – 5,14,247 + 1,35,096

5. 67,54,796 – 25,43,187 + 14,309 – 17,546

6. 42,00,764 – 11,34,186 – 24,15,342 + 15,31,427

7. 4,54,32,189 + 3,56,21,425 − 3,96,19,249 − 2,14,15,270

8. Subtract the difference of 2,18,25,400 and 3,26,14,349 from their sum.

TRICKY CHALLENGE

Select a 7-digit number such that digits from left to right are in descending order and not repeated.

- Reverse them and subtract
- Reverse the difference again
- Add it to the difference
- Check the result

```
   ┌──────────┐              ┌──────────┐
   │          │              │          │
   └──────────┘              └──────────┘
 ┌──────────┐            ┌──────────┐
−│          │          +│          │
 └──────────┘            └──────────┘
 ──────────              ──────────
 ──────────              ──────────
```

Word Problems On Mixed Operations (Addition & Subtraction)

Example 1 : The population of a city is 5,87,206. There are 2,72,564 men and 2,35,789 women. The remaining are children. How many children are there in the city?

Solution : Number of men in the city = 2,72,564

Number of women in the city = 2,35,789

Number of men and women in the city

$$= 2,72,564 + 2,35,789$$

$$= 5,08,353$$

```
  1     1 1 1
  2 7 2 5 6 4
+ 2 3 5 7 8 9
  5 0 8 3 5 3
```

Now, total population of the city = 5,87,206

Number of men and women = 5,08,353

So, number of children = 5,87,206 − 5,08,353

$$= 78,853$$

```
  7 16 11 10
  5 8 7 2 0 6
− 5 0 8 3 5 3
  0 7 8 8 5 3
```

Hence, the number of children in the city is 78,853.

Example 2 : The price of a car in the year 2009 was ₹ 14,56,725. Its price in the year 2010 was increased by ₹ 65,289. But its price in the year 2011 was reduced by 36,728. Find the price of the car in the year 2011.

Solution : Price of the car in the year 2009 = ₹ 14,56,725

Price of the car in the year 2010

= ₹ 14,56,725 + ₹ 65,289

= ₹ 15,22,014

Now, price of the car in the year 2011

= ₹ 15,22,014 – ₹ 36,728

= ₹ 14,85,286

Hence, the price of the car in the year 2011 is ₹ 14,86,286.

1	1	1	1	1		
1	4	5	6	7	2	5
	+	6	5	2	8	9
1	5	2	2	0	1	4

	11	11	9	10	14	
1	5	2	2	0	1	4
	–	3	6	7	2	8
1	4	8	5	2	8	6

Exercise - 4(F)

1. Add the difference of 8,75,250 and 2,34,136 to the sum of 2,56,740 and 3,47,397.

2. On the first day of a football match, there were 54,750 people in the stadium. On the second day, the crowd was of 45,780 people. On the third day, there were 23,607 people more than on the second day. Find the difference between the number of spectators on the first and third day.

3. The sum of three numbers is 8,95,72,183. If two of them are 4,70,28,150 and 1,56,39,245, find the third number.

4. From a wire of 60,000 m long, two pieces measuring 7,526 m and 9,427 m were cut off. Find the length of the remaining wire.

5. Mr. Kartik Sharma has ₹ 27,50,680 with him. He gave ₹ 10,25,500 to his son, ₹ 12,25,900 to his wife and the rest to his daughter. How much money was received by his daughter?

6. A man invested ₹ 2,56,65,950 in a business for two years. In the first year, he

got a profit of ₹ 4,56,209. In the second year, he faced a loss of ₹ 1,85,000. Find the net amount he will get at the end of the second year.

7. What must be added to the sum of 35,725 and 25,148 to get the difference of 2,47,178 and 3,48,965?

8. A poultry farm had 96,000 chickens. The owner sold 18,972 chickens on first day and 25,600 on second day. How many were left on third day?

Review Of The Chapter

1. Subtract :

(a)
TL	L	TTh	Th	H	T	O
8	7	5	6	2	8	3
− 5	3	4	1	1	7	2

(b)
TL	L	TTh	Th	H	T	O
6	5	7	9	4	3	2
− 4	3	2	5	1	2	0

(c)
C	TL	L	TTh	Th	H	T	O
7	3	2	1	5	4	7	0
−3	8	7	2	5	6	7	8

(d)
C	TL	L	TTh	Th	H	T	O
9	2	0	0	5	6	4	7
−8	4	7	2	6	7	8	3

(e)
C	TL	L	TTh	Th	H	T	O
5	4	7	8	1	7	6	7
−2	6	3	9	5	2	8	3

(f)
C	TL	L	TTh	Th	H	T	O
4	3	2	6	7	0	5	3
−1	9	8	7	5	6	7	4

2. Find the difference between each of the following and verify your answer :
   (a) 67,52,189 − 28,64,327   (b) 48,57,208 − 15,36,429
   (c) 9,34,75,694 − 3,72,84,792   (d) 5,79,18,765 − 2,87,65,324
   (e) 4,60,00,183 − 2,56,78,297   (f) 7,57,47,840 − 3,64,57,289

3. Simply :
   (a) 28,578 + 14,723 − 20,548 + 15,345
   (b) 75,34,189 − 26,14,726 − 28,14,340 + 32,56,149
   (c) 7,42,56,250 + 2,56,47,138 − 5,47,50,249
   (d) 5,32,14,287 + 28,147 − 1,34,56,280 + 36,425

4. In the year 2009, a factory produced 6,28,750 scooters. Next year, the production was decreased by 18,759. How many scooters were produced in the year 2010?

5. What is the difference between the greatest 6-digit number and 1 less than the smallest 7-digit number?

6. Rahul had ₹ 7,54,200 with him. He purchased a house for ₹ 5,25,600 and a bike for ₹ 1,25,000. How much money was left with him?

MULTIPLE CHOICE QUESTIONS (MCQs)

1. In 28,756 – 13,241 = 15,515; the subtrahend is :

   (a) 28,756 ☐ (b) 13,241 ☐ (c) 15,515 ☐

2. In 19,82,563 – 8,61,242 = 11,21,321; the minuend is :

   (a) 19,82,563 ☐ (b) 8,61,242 ☐ (c) 11,21,321 ☐

3. The result of subtraction is called the :

   (a) Minuend ☐ (b) Subtrahend ☐ (c) Difference ☐

4. The difference of the place-values of 7s in 7,62,715 is :

   (a) 6,99,300 ☐ (b) 6,99,600 ☐ (c) None of these ☐

5. 6,75,28,567 – 10,000 = _____.

   (a) 5,75,28,567 ☐ (b) 6,65,28,567 ☐ (c) 6,75,18,567 ☐

6. 85,72,194 – 2,000 = _____.

   (a) 83,72,194 ☐ (b) 85,62,194 ☐ (c) 85,70,194 ☐

7. What should be subtracted from 6 ten thousands to get 6 hundreds?

   (a) 59,400 ☐ (b) 69,400 ☐ (c) None of these ☐

8. 32,560 – 2,000 + 6,000 = _____.

   (a) 30,560 ☐ (b) 36,560 ☐ (c) 38,560 ☐

9. What must be added to 87,25,409 to get 6,28,14,720 ?

   (a) 5,49,89,329 ☐ (b) 5,40,89,311 ☐ (c) 5,41,89,320 ☐

10. 8 lakhs + 9 ten-thousands = _____ lakhs + 19 ten-thousands.

    (a) 7 ☐ (b) 8 ☐ (c) 9 ☐

Multiplication

Multiplication

In the previous class, we have learnt how to multiply a number by a number consisting 2 or 3-digits.

Following terms are used in multiplication :

1. Multiplicand : The number to be multiplied is called the multiplicand.

2. Multiplier : The number by which we multiply is called the multiplier.

3. Product : The result we obtain after the multiplication is called the product.

Example : In $256 \times 2 = 512$, we have : multiplicand = 256, multiplier = 2, and product = 512.

Properties Of Multiplication

1. Order Property Of Multiplication :

Example 1 : Find the products : 72×35 and 35×72. What do you observe?

Solution : We have :

	7 2
×	3 5
	3 6 0
	2 1 6 0
	2 5 2 0

	3 5
×	7 2
	7 0
	2 4 5 0
	2 5 2 0

Thus, $72 \times 35 = 35 \times 72 = 2{,}520$.

Hence, we observe that,

The product of two numbers does not change, even when the order of numbers is changed.

2. Grouping Property Of Multiplication :

Example 2 : Find the products :

$(28 \times 3) \times 4$ and $28 \times (3 \times 4)$

What do you observe?

Solution : We have :

$(28 \times 3) \times 4 = 84 \times 4$	$28 \times (3 \times 4) = 28 \times 12$
$= 336$	$= 336$

Thus, $(28 \times 3) \times 4 = 28 \times (3 \times 4) = 336$.

Hence, we observe that,

The product of three numbers does not change, even when the grouping of numbers is changed.

3. Multiplicative Property Of 1 :

Example 3 : Find the products : 365×1 and $2{,}427 \times 1$. What do you observe?

Solution : We have :

```
    3 6 5              2 4 2 7
  ×     1            ×       1
  ───────            ─────────
    3 6 5              2 4 2 7
```

Thus, $365 \times 1 = 365$ and $2{,}427 \times 1 = 2427$.

Hence, we observe that,

The product of a number and 1 is the number itself.

4. Multiplicative Property Of 0 :

Example 4 : Find the products : 642×0 and $3,947 \times 0$. What do you observe?

Solution : We have :

$$
\begin{array}{r}
6\ 4\ 2 \\
\times\quad 0 \\
\hline
0\ 0\ 0 \\
\end{array}
\qquad
\begin{array}{r}
3\ 9\ 4\ 7 \\
\times\quad 0 \\
\hline
0\ 0\ 0\ 0 \\
\end{array}
$$

Thus, $642 \times 0 = 0$ and $3,947 \times 0 = 0$.

Hence, we observe that,

The product of any number and 0 is 0.

5. Distributive Property Of Multiplication

Example 5 : Find the results :

$7 \times (8 + 4)$ and $(7 \times 8) + (7 \times 4)$

What do you observe?

Solution : We have :

$$
\begin{array}{l|l}
7 \times (8 + 4) = 7 \times 12 & (7 \times 8) + (7 \times 4) = 56 + 28 \\
\qquad\qquad\quad = 84 & \qquad\qquad\qquad\qquad\quad = 84
\end{array}
$$

Thus, $7 \times (8 + 4) = (7 \times 8) + (7 \times 4) = 84$.

Hence, we observe that,

Multiplying a sum by a number gives the same result as multiplying each addend by the number and then adding the products together.

> **KEEP IN MIND**
>
> *Distributive property of multiplication can also be used for subtraction.*
>
> *i.e., $10 \times (9 - 6) = (10 \times 9) - (10 \times 6) = 30$.*

This property is known as Distributive Property of Multiplication Over Addition.

Multiplication By Tens

To multiply a number by 10, 20, 30, ... 90, multiply the number by 1,

2, 3,.... 9 respectively and insert one zero on the right of the product.

Example 1 : Multiply 2,567 by 20.

Solution : 2,567 × 20 = (2,567 × 2) × 10

= 5,134 × 10

= 51,340

Example 2 : Multiply 15,643 by 70.

Solution : 15,643 × 70 = (15,643 × 7) × 10

= 1,09,501 × 10

= 10,95,010

Multiplication By Hundreds

To multiply a number by 100, 200, 300, ... 900, multiply the number by 1, 2, 3, ...9, respectively and insert two zeroes on the right of the product.

Example 1 : Multiply 1,382 by 400.

Solution : 1,382 = (1,382 × 4) × 100

= 5,528 × 100

= 5,52,800

Example 2 : Multiply 24,726 by 300.

Solution : 24,726 = (24,726 × 3) × 100

= 74,178 × 100

= 74,17,800

Multiplication By Thousands

To multiply a number by 1,000, 2,000, 3,000, ..., 9,000, multiply the number by 1, 2, 3, ..., 9, respectively and insert three zeroes on the right of the product.

Example 1 : Multiply 1,329 by 4,000.

Solution : $1,329 \times 4,000 = (1,329 \times 4) \times 1,000$

$$= 5,316 \times 1,000$$
$$= 53,16,000$$

Example 2 : Multiply 7,243 by 6,000.

Solution : $7,243 \times 6,000 = (7,243 \times 6) \times 1,000$

$$= 43,458 \times 1,000$$
$$= 4,34,58,000$$

Exercise - 5(A)

1. Fill in the blanks :

(a) 632 × 25 = 25 × _____   (b) 429 × _____ = 13 × 429

(c) _____ × 1 = 4,960   (d) 7,386 × 0 = _____

(e) 1 × _____ = 9,728   (f) 798 × _____ = 0

(g) (28 × 39) × 42 = 28 × (_____ × 42)   (h) 145 × (72 × 96) = (_____ × 72) × 96

(i) 73 × (_____ + 41) = (73 × 26) + (73 × 41)

(j) 347 × (18 + _____) = (347 × 18) + (347 × 20)

(k) (56 × 75) × 81 = 56 × (_____ × 81)

(l) 104 × (85 + 26) = (104 × _____) + (_____ × 26)

2. Find the following products :

(a) 439 × 10 = _____   (b) 1,247 × 10 = _____   (c) 16,734 × 10 = _____

(d) 952 × 100 = _____   (e) 3,680 × 100 = _____   (f) 41,387 × 100 = _____

(g) 368 × 1,000 = _____   (h) 2,567 × 1,000 = _____   (i) 9,308 × 10,000 = _____

3. Find the following products :

(a) 8,356 × 20   (b) 9,182 × 70   (c) 4,263 × 50

(d) 392 × 500   (e) 174 × 300   (f) 1,697 × 900

(g) 429 × 4,000   (h) 387 × 6,000   (i) 284 × 8,000

(j) 917 × 2,000   (k) 115 × 3,000   (l) 683 × 7,000

Multiplication Of A Number By A 2-Digit Number

Example 1 : Multiply 3,256 by 26.

Solution :

　Step 1 : Write the multiplicand and the multiplier as shown.

$$
\begin{array}{r}
3256 \\
\times\ 26 \\
\hline
\end{array}
$$

　Step 2 : Multiply 3,256 by 6 and write the partial product as shown.

$$
\begin{array}{r}
3256 \\
\times\ 26 \\
\hline
19536 \\
\end{array}
$$

　　　　← (20 + 6)
　　　　← (3,256 × 6)

　Step 3 : Since 2 is at tens place we have to multiply 3,256 by 20. So, multiply 3,256 by 20.

$$
\begin{array}{r}
3256 \\
\times\ 26 \\
\hline
19536 \\
65120 \\
\end{array}
$$

　　　　← (20 + 6)
　　　　← (3,256 × 6)
　　　　← (3,256 × 20)

　Step 4 : Add the two partial products.

$$
\begin{array}{r}
3256 \\
\times\ 26 \\
\hline
19536 \\
65120 \\
\hline
84656 \\
\end{array}
$$

　　　　← (20 + 6)
　　　　← (3,256 × 6)
　　　　← (3,256 × 20)
　　　　← (3,256 × 26)

　　Hence, 3,256 × 56 = 84,656.

Example 2 : Multiply 29,507 by 32.

Solution : Arrange the multiplicand and the multiplier as shown and then multiply.

$$
\begin{array}{r}
29507 \\
\times\ 32 \\
\hline
59014 \\
795210 \\
\hline
854224 \\
\end{array}
$$

　　　　← (30 + 2)
　　　　← (29,507 × 2)
　　　　← (29,507 × 30)
　　　　← (29,507 × 32)

　　Hence, 29,507 × 32 = 8,54,224.

Exercise - 5(B)

1. Find the following products :

(a)
```
  3 2 5
×   2 4
```

(b)
```
  7 1 2 6
×     5 7
```

(c)
```
  3 8 5 4
×     3 5
```

(d)
```
  1 0 5 4
×     4 2
```

(e)
```
  5 2 5 6
×     5 4
```

(f)
```
  1 3 9 7
×     6 3
```

(g)
```
  4 8 9 3
×     2 1
```

(h)
```
  3 9 2 8
×     3 6
```

(i)
```
  4 3 2 5 9
×       2 7
```

(j)
```
  6 7 3 0 8
×       1 9
```

(k)
```
  1 1 4 7 2
×       3 7
```

(l)
```
  2 5 4 0 7
×       4 1
```

2. Multiply :

(a) 327 by 26   (b) 147 by 34   (c) 927 by 22

(d) 1,393 by 39   (e) 4,264 by 52   (f) 6,342 by 41

(g) 17,548 by 36   (h) 45,293 by 15   (i) 21,673 by 25

TRICKY CHALLENGE

Guess further, to proceed :

11 × 11 = 121   1 × 9 + 2 = 11

111 × 111 = 12321   12 × 9 + 3 = 111

1111 × 1111 = 1234321   123 × 9 + 4 = _____

11111 × 11111 = _____   1234 × 9 + 5 = _____

111111 × 111111 = _____   12345 × 9 + 6 = _____

_____ × _____ = _____ `   _____

Multiplication Of A Number By A 3-Digit Number

Example 1 : Multiply 295 by 123.

Solution : We have, $123 = 100 + 20 + 3$.

So, we multiply 295 by 3, 20 and 100 respectively. Finally, we add the results to get the required product.

```
        2 9 5
    ×   1 2 3  ←——— (100 + 20 + 3)
          8 8 5  ←——— (295 × 3)
        5 9 0 0  ←——— (295 × 20)
      2 9 5 0 0  ←——— (295 × 100)
      3 6 2 8 5  ←——— (295 × 123)
```

Hence, $295 × 123 = 36,285$.

Example 2 : Multiply 4,216 by 243.

Solution : We have, $243 = 200 + 40 + 3$.

So, we multiply 4,216 by 3, 40 and 200 respectively. Finally, we add the results to get the required product

```
        4 2 1 6
    ×     2 4 3  ←——— (200 + 40 + 3)
        1 2 6 4 8  ←——— (4,216 × 3)
      1 6 8 6 4 0  ←——— (4,216 × 40)
      8 4 3 2 0 0  ←——— (4,216 × 200)
    1 0 2 4 4 8 8  ←——— (4,216 × 243)
```

Hence, $4,216 × 243 = 10,24,488$.

Example 3 : Multiply 22,563 by 146.

Solution : We have, $146 = 100 + 40 + 6$.

```
        2 2 5 6 3
    ×     1 4 6  ←——— (100 + 40 + 6)
        1 3 5 3 7 8  ←——— (22,563 × 6)
        9 0 2 5 2 0  ←——— (22,563 × 40)
      2 2 5 6 3 0 0  ←——— (22,563 × 100)
      3 2 9 4 1 9 8  ←——— (22,563 × 146)
```

So, we multiply 22,563 by 6, 40 and 100 respectively. Finally, we add the results to get the required product.

Hence, $22,563 \times 146 = 32,94,198$.

Exercise - 5(C)

1. Find the following products :

(a)
```
    4 3 9
×   2 4 7
```

(b)
```
    7 5 3
×   1 1 4
```

(c)
```
    1 7 8
×   2 5 9
```

(d)
```
    9 4 6
×   2 5 4
```

(e)
```
  1 4 3 8
×   2 1 5
```

(f)
```
  3 6 8 4
×   2 4 9
```

(g)
```
  8 4 3 1
×   3 6 5
```

(h)
```
  1 9 7 6
×   4 1 2
```

(i)
```
  5 9 3 4 1
×     1 2 4
```

(j)
```
  3 6 8 4 3
×     2 2 3
```

(k)
```
  4 1 8 7 5
×     3 5 1
```

(l)
```
  2 1 8 5 6
×     1 4 6
```

2. Multiply :

(a) 739 by 264   (b) 425 by 135   (c) 904 by 207

(d) 1,467 by 316   (e) 3,894 by 278   (f) 2,569 by 324

(g) 22,364 by 128   (h) 13,698 by 205   (i) 41,764 by 321

Word Problems Based On Multiplication

Example 1 : A bag contains 225 kg rice. How much rice will 146 such bags have?

Solution : 1 bag contains = 225 kg rice

146 bags contain = 225×146 kg rice

Hence, 146 bags will contain 32,850 kg rice.

```
      2 2 5
×     1 4 6
    1 3 5 0
    9 0 0 0
  2 2 5 0 0
  3 2 8 5 0
```

Example 2 : A bike costs ₹ 45,560. How much will 242 bikes cost?

Solution : Cost of 1 bike = ₹ 45,560

Cost of 242 bikes = ₹ (45,560 × 242)

Hence, the cost of 242 bikes is ₹ 1,10,25,520.

```
      4 5 5 6 0
    ×   2 4 2
      9 1 1 2 0
  1 8 2 2 4 0 0
  9 1 1 2 0 0 0
1 1 0 2 5 5 2 0
```

Exercise - 5(D)

1. A company produces 736 cricket bats every day. How many cricket bats will it produce in 365 days.

2. A book has 165 pages. How many pages will 60 copies of this book have?

3. An almirah can hold 428 books. How many books can be kept in 145 such almirahs?

4. How much money was collected from 1,456 students of a school for a charity show, if each student contributed ₹ 651?

5. The cost of a bicycle is ₹ 3568. Find the cost of 135 bicycles.

6. There are four sections in class III of a school. Each section consists of 98 students. If the monthly fee of each student is ₹ 645, find the total amount of fee collected from the whole class in a month.

7. A bus travels a distance of 325 km every day. What distance will it travel in a year?

8. The capacity of a water tank is 8,475 litres. In a city, there are 142 such tanks. What is the storage capacity of the city?

9. A packet has 1,000 typing sheets. How many sheets will 85 such packets have?

10. A battalion has 2,460 soldiers. How many soldiers will 18 battalions have?

Review Of The Chapter

1. **Fill in the blanks :**

   (a) 725 × _____ = 156 × 725   (b) 42,563 × _____ = 0

   (c) 83 × (42 + 56) = (83 × _____) + (83 × 56)

   (d) 134 × (179 + _____) = (134 × 179) + (134 × 210)

   (e) 1,368 × _____ = 1,368   (f) 9,425 × 0 = _____

2. **Find the following products :**

   (a)
   ```
       1 5 7
     ×   4 0
   ```

   (b)
   ```
       2 3 5
     ×   1 6
   ```

   (c)
   ```
     3 1 4 9
     ×   2 7
   ```

   (d)
   ```
     4 2 8 9 5
       ×   6 9
   ```

   (e)
   ```
         8 9 5
     ×   1 3 6
   ```

   (f)
   ```
       6 1 3 8
     ×   2 4 3
   ```

   (g)
   ```
     3 1 7 5 2
       × 1 9 6
   ```

   (h)
   ```
     2 1 5 6 1
       × 1 2 3
   ```

3. **Multiply :**

   (a) 675 by 127   (b) 1193 by 500   (c) 4,598 by 135

   (d) 32,564 by 248   (e) 75,432 by 347   (f) 8,134 by 6,000

   (g) 67,312 by 20   (h) 18,920 by 10   (i) 6,543 by 700

4. To build each section of the boundary wall of a housing society, 5,069 bricks are needed. The boundary wall has 49 sections. How many bricks are required to construct complete boundary wall?

5. A group has 95 members. How many members will 200 such groups have?

6. An auditorium has 1,500 seats. How many people can sit in 45 shows of a play?

MULTIPLE CHOICE QUESTIONS (MCQs)

1. In 72 × 5 = 360, the multiplier is :

   (a) 72 ☐   (b) 5 ☐   (c) 360 ☐

2. In 1136 × 17 = 19,312, the multiplicand is :

   (a) 1136 ☐   (b) 17 ☐   (c) 19,312 ☐

3. The result we obtain after the multiplication is called the :

(a) Multiplicand ☐ (b) Multiplier ☐ (c) Product ☐

4. Which of the following shows grouping property of multiplication?

(a) $683 \times 125 = 125 \times 682$ ☐

(b) $(21 \times 2) \times 5 = 21 \times (2 \times 5)$ ☐

(c) $15 \times (9 + 6) = (15 \times 9) + (15 \times 6)$ ☐

5. $63,827 \times$ _____ $= 0$.

(a) 0 ☐ (b) 1 ☐ (c) 63,827 ☐

6. $15,326 \times 1 =$ _____.

(a) 1 ☐ (b) 15,326 ☐ (c) None of these ☐

7. $380 \times 100 =$ _____.

(a) 380 ☐ (b) 3,800 ☐ (c) 38,000 ☐

8. The product of the place-values of 4 in 46,348 is :

(a) 16,000 ☐ (b) 1,60,000 ☐ (c) 16,00,000 ☐

9. $130 \times 1,000 =$ _____.

(a) 13,000 ☐ (b) 1,30,000 ☐ (c) 13,00,000 ☐

10. The product of the greatest 3-digit number and the smallest 4-digit number is :

(a) 9,990 ☐ (b) 99,900 ☐ (c) 9,99,000 ☐

11. Which of the following shows distributive property of multiplication over addition?

(a) $9,756 \times 183 = 183 \times 9,756$ ☐

(b) $(42 \times 18) \times 7 = 42 \times (18 \times 7)$ ☐

(c) $17 \times (18 + 20) = 17 \times 18 + 17 \times 20$ ☐

12. $5 \times 4,000 =$ _____.

(a) 40,000 ☐ (b) 20,000 ☐ (c) 2,000 ☐

Division

Division

Division is a process of repeated subtraction. It means to share or divide equally.

Some terms used in division problems are as follows :

1. **Dividend** : The number to be divided is called the dividend.

2. **Divisor** : The number by which we divide the dividend is called the divisor.

3. **Quotient** : The number that we get after the division is called the quotient.

4. **Remainder** : The number which is left undivided is called the remainder.

Example :

$$
\begin{array}{r}
53 \\
9\overline{)479} \\
-45\downarrow \\
\hline
29 \\
-27 \\
\hline
2
\end{array}
$$

Here, dividend = 479, divisor = 9, quotient = 53, and remainder = 2.

An Important Result : In a division sum, we always have :

$$\boxed{\text{Dividend} = (\text{Divisor} \times \text{Quotient}) + \text{Remainder}}$$

Division By 1-Digit Number

In the previous class, we have already learnt how to divide a number

by a 1-digit number. Here, we shall further practice with dividend upto 6-digit number to attain mastery over this operation.

Example 1 : Divide 3,25,678 by 2.

Solution :

Step 1 :

$$2\overline{)325678}$$

Step 2 :

$$\begin{array}{r} 1 \\ 2\overline{)325678} \\ -2 \\ \hline 1 \end{array}$$

Step 3 :

$$\begin{array}{r} 16 \\ 2\overline{)325678} \\ -2 \\ \hline 12 \\ -12 \\ \hline 0 \end{array}$$

Step 4 :

$$\begin{array}{r} 162 \\ 2\overline{)325678} \\ -2 \\ \hline 12 \\ -12 \\ \hline 05 \\ -4 \\ \hline 1 \end{array}$$

Step 5 :

$$\begin{array}{r} 1628 \\ 2\overline{)325678} \\ -2 \\ \hline 12 \\ -12 \\ \hline 05 \\ -4 \\ \hline 16 \\ -16 \\ \hline 0 \end{array}$$

Step 6 :

$$\begin{array}{r} 16283 \\ 2\overline{)325678} \\ -2 \\ \hline 12 \\ -12 \\ \hline 05 \\ -4 \\ \hline 16 \\ -16 \\ \hline 07 \\ -6 \\ \hline 1 \end{array}$$

Step 7 :

$$\begin{array}{r} 162839 \\ 2\overline{)325678} \\ -2 \\ \hline 12 \\ -12 \\ \hline 05 \\ -4 \\ \hline 16 \\ -16 \\ \hline 07 \\ -6 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$$

Hence, 3,25,678 ÷ 2 = 1,62,839.

Example 2 : Divide 1,02,794 by 4 and verify your answer.

Solution :

Step 1 :

$$4\overline{)102794}$$

Step 2 :

$$\begin{array}{r} 2 \\ 4\overline{)102794} \\ -8 \\ \hline 2 \end{array}$$

Step 3 :

$$\begin{array}{r} 25 \\ 4\overline{)102794} \\ -8 \\ \hline 22 \\ -20 \\ \hline 2 \end{array}$$

Step 4 :

$$\begin{array}{r} 256 \\ 4\overline{)102794} \\ -8 \\ \hline 22 \\ -20 \\ \hline 27 \\ -24 \\ \hline 3 \end{array}$$

Step 5 :

$$\begin{array}{r} 2569 \\ 4\overline{)102794} \\ -8 \\ \hline 22 \\ -20 \\ \hline 27 \\ -24 \\ \hline 39 \\ -36 \\ \hline 3 \end{array}$$

Step 6 :

$$\begin{array}{r} 25698 \\ 4\overline{)102794} \\ -8 \\ \hline 22 \\ -20 \\ \hline 27 \\ -24 \\ \hline 39 \\ -36 \\ \hline 34 \\ -32 \\ \hline 2 \end{array}$$

> **KEEP IN MIND**
> - *If a number is divided by itself, the answer is always 1.*
> - *If a number is divided by 1, the answer is the number itself.*

Hence, 1,02,794 ÷ 4 gives quotient = 25,698 and remainder = 2.

Verification :

We know, Dividend = Divisor × Quotient + Remainder

$$= 4 \times 25{,}698 + 2 = 1{,}02{,}792 + 2$$

$$= 1{,}02{,}794 = \text{Dividend}$$

Hence, our answer is correct.

Observe the following examples :

```
      2305  ← Quotient
   3)6915
    - 6↓
      09
    - 9↓↓
      015
    - 15
       0  ← Remainder
```

```
      3551  ← Quotient
   7)24863
    - 21↓
      38
    - 35↓
      36
    - 35↓
      13
    -  7
       6  ← Remainder
```

```
      6067  ← Quotient
   9)54607
    - 54↓↓
      060
    - 54↓
      67
    - 63
       4  ← Remainder
```

Exercise - 6(A)

1. Divide and find the quotient and the remainder of each of the following :

    (a) 1,686 ÷ 3   (b) 34,160 ÷ 5   (c) 45,196 ÷ 8

    (d) 11,396 ÷ 2   (e) 3,53,844 ÷ 6   (f) 3,15,861 ÷ 7

    (g) 5987 ÷ 4   (h) 4,49,848 ÷ 8   (i) 3,49,176 ÷ 5

    (j) 1,71,348 ÷ 2   (k) 6,67,592 ÷ 3   (l) 1,15,674 ÷ 6

2. Divide and verify your answer :

    (a) 3,12,990 ÷ 5   (b) 6,84,008 ÷ 4   (c) 2,27,836 ÷ 2

    (d) 6,42,597 ÷ 6   (e) 3,94,370 ÷ 8   (f) 6,56,742 ÷ 9

Division By 2-Digit Number

Example 1 : Divide 6,347 by 11.

Solution :

Step 1 :

$$11\overline{)6347}$$

Step 2 :

$$\begin{array}{r} 5 \\ 11\overline{)6347} \\ -55 \\ \hline 8 \end{array}$$

Step 3 :

$$\begin{array}{r} 57 \\ 11\overline{)6347} \\ -55\downarrow \\ \hline 84 \\ -77 \\ \hline 7 \end{array}$$

Step 4 :

$$\begin{array}{r} 577 \\ 11\overline{)6347} \\ -55\downarrow \\ \hline 84 \\ -77\downarrow \\ \hline 77 \\ -77 \\ \hline 0 \end{array}$$

Hence, $6{,}347 \div 11 = 577$.

Example 2 : Divide 82,655 by 15 and verify your answer.

Solution :

Step 1 :

$$15\overline{)82655}$$

Step 2 :

$$\begin{array}{r} 5 \\ 15\overline{)82655} \\ -75 \\ \hline 7 \end{array}$$

Step 3 :

$$\begin{array}{r} 55 \\ 15\overline{)82655} \\ -75\downarrow \\ \hline 76 \\ -75 \\ \hline 1 \end{array}$$

Step 4 :

$$\begin{array}{r} 551 \\ 15\overline{)82655} \\ -75\downarrow \\ \hline 76 \\ -75\downarrow \\ \hline 15 \\ -15 \\ \hline 0 \end{array}$$

Step 5 :

$$\begin{array}{r} 5510 \\ 15\overline{)82655} \\ -75\downarrow \\ \hline 76 \\ -75\downarrow \\ \hline 15 \\ -15\downarrow \\ \hline 05 \\ -0 \\ \hline 5 \end{array}$$

Since, $5 < 15$, 5 cannot be divided by 15. So, we consider it as remainder.

Hence, $82{,}655 \div 15$ gives quotient $= 5510$ and remainder $= 5$.

Mathematics 3rd

Verification :

We know,

$$\text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$$
$$= 15 \times 5510 + 5 = 82,655 = \text{Dividend}$$

Hence, our answer is correct.

Observe the following examples :

```
          5 5 1 0
        ×     1 5
        2 7 5 5 0
      + 5 5 1 0 0
        8 2 6 5 0
      +       5
        8 2 6 5 5
```

```
           5698  ←── Quotient
      18) 102564
         − 90↓
           125
         − 108↓
            176
          − 162↓
             144
           − 144
               0  ←── Remainder
```

```
           1546  ←── Quotient
      21) 32466
         − 21↓
           114
         − 105↓
             96
           − 84↓
            126
          − 126
              0  ←── Remainder
```

```
           5698  ←── Quotient
      24) 136757
         − 120↓
           167
         − 144↓
            235
          − 216↓
            197
          − 192
              5  ←── Remainder
```

Exercise - 6(B)

1. Divide and find the quotient and the remainder of each of the following :

   (a) 83,564 ÷ 12 (b) 69,427 ÷ 14 (c) 1,146 ÷ 11

   (d) 48,706 ÷ 16 (e) 95,324 ÷ 13 (f) 75,639 ÷ 15

   (g) 4,26,540 ÷ 20 (h) 7,56,289 ÷ 32 (i) 5,02,565 ÷ 25

   (j) 8,73,028 ÷ 16 (k) 4,43,588 ÷ 42 (l) 2,94,638 ÷ 22

2. Divide and verify your answer :

   (a) 6,935 ÷ 15 (b) 42,568 ÷ 14 (c) 65,312 ÷ 27

   (d) 2,07,459 ÷ 21 (e) 7,94,004 ÷ 36 (f) 1,87,549 ÷ 31

Division By 3-Digit Number

Example 1 : Divide 52,440 by 115.

Solution :

Step 1 :

$$115\overline{)52440}$$

Step 2 :

$$\begin{array}{r} 4 \\ 115\overline{)52440} \\ -460 \\ \hline 64 \end{array}$$

Step 3 :

$$\begin{array}{r} 45 \\ 115\overline{)52440} \\ -460\downarrow \\ \hline 644 \\ -575 \\ \hline 69 \end{array}$$

Step 4 :

$$\begin{array}{r} 456 \\ 115\overline{)52440} \\ -460\downarrow \\ \hline 644 \\ -575\downarrow \\ \hline 690 \\ -690 \\ \hline 0 \end{array}$$

Hence, $52,440 \div 115 = 456$.

Example 2 : Divide 7,06,554 by 124 and verify your answer.

Solution :

Step 1 :

$$124\overline{)706554}$$

Step 2 :

$$\begin{array}{r} 5 \\ 124\overline{)706554} \\ -620 \\ \hline 86 \end{array}$$

Step 3 :

$$\begin{array}{r} 56 \\ 124\overline{)706554} \\ -620\downarrow \\ \hline 865 \\ -744 \\ \hline 121 \end{array}$$

Step 4 :

$$\begin{array}{r} 569 \\ 124\overline{)706554} \\ -620\downarrow \\ \hline 865 \\ -744\downarrow \\ \hline 1215 \\ -1116 \\ \hline 99 \end{array}$$

Step 5 :

$$\begin{array}{r} 5698 \\ 124\overline{)706554} \\ -620\downarrow \\ \hline 865 \\ -744\downarrow \\ \hline 1215 \\ -1116\downarrow \\ \hline 994 \\ -992 \\ \hline 2 \end{array}$$

Hence, $7,06,554 \div 124$ gives quotient = 5,698 and remainder = 2.

Verification :

We know, Dividend = Divisor × Quotient + Remainder

$$= 124 \times 5698 + 2$$

$$= 7,06,554 = \text{Dividend}.$$

Hence, our answer is correct.

$$\begin{array}{r} 5698 \\ \times\ 124 \\ \hline 22792 \\ +113960 \\ +569800 \\ \hline 706552 \\ +\ 2 \\ \hline 706554 \end{array}$$

Exercise - 6(C)

1. Divide and find the quotient and the remainder of each of the following :

(a) 59,010 ÷ 105   (b) 1,57,374 ÷ 241   (c) 53,046 ÷ 126

(d) 5,65,268 ÷ 116   (e) 40,829 ÷ 324   (f) 1,07,630 ÷ 235

(g) 57,125 ÷ 125   (h) 5,73,028 ÷ 254   (i) 1,13,397 ÷ 145

(j) 1,12,520 ÷ 232   (k) 2,93,224 ÷ 540   (l) 2,37,728 ÷ 152

2. Divide and verify your answer :

(a) 8,12,035 ÷ 135   (b) 1,83,682 ÷ 205   (c) 97,008 ÷ 172

(d) 30,000 ÷ 210   (e) 1,74,729 ÷ 320   (f) 1,30,975 ÷ 155

Division By 10

Example 1 : Divide : (a) 675 by 10   (b) 42,903 by 10

(c) 8,00,000 by 10

What do you observe?

Solution : (a) 675 ÷ 10

$$\begin{array}{r} 67 \\ 10\overline{)675} \\ -60\downarrow \\ \hline 75 \\ -70 \\ \hline 5 \end{array}$$

675 ÷ 10

Quotient   Remainder

Hence, 675 ÷ 10 gives quotient = 67 and remainder = 5.

(b) 42,903 ÷ 10

$$
\begin{array}{r}
4290 \\
10\overline{\smash{)}42903} \\
-40 \\
\hline
29 \\
-20 \\
\hline
90 \\
-90 \\
\hline
3 \\
-0 \\
\hline
3 \\
\end{array}
$$

$$4\,2\,9\,0\,3 \div 10$$

Quotient   Remainder

Hence, 42903 ÷ 10 gives quotient = 4,290 and remainder = 3.

(c) 8,00,000 ÷ 10

$$
\begin{array}{r}
80000 \\
10\overline{\smash{)}800000} \\
-80 \\
\hline
00 \\
-00 \\
\hline
00 \\
-00 \\
\hline
00 \\
-00 \\
\hline
0 \\
\end{array}
$$

$$8\,0\,0\,0\,0\,0 \div 10$$

Quotient   Remainder

Hence, 8,00,000 ÷ 10 gives quotient = 80,000 and remainder = 0.

Hence, we observe that,

When a number (dividend) is divided by 10, the quotient is obtained by removing the ones digit from the number (dividend) and the remainder is the ones digit of the number.

Division By 100

Example 2 : Divide : (a) 1,356 by 100　　　(b) 47,038 by 100
　　　　　　　　　　(c) 8,90,000 by 100
　　　What do you observe ?

Solution : (a) 1,356 ÷ 100

$$
\begin{array}{r}
13 \\
100{\overline{\smash{\big)}\,1356}} \\
-100\!\downarrow \\
\hline
356 \\
-300 \\
\hline
56 \\
\hline
\end{array}
$$

1 3 5 6 ÷ 100

Quotient   Remainder

Hence, 1,356 ÷ 100 gives quotient = 13 and remainder = 56.

(b) 47,038 ÷ 100

$$
\begin{array}{r}
470 \\
100{\overline{\smash{\big)}\,47038}} \\
-400\!\downarrow \\
\hline
703 \\
-700\!\downarrow \\
\hline
38 \\
-00 \\
\hline
38 \\
\hline
\end{array}
$$

4 7 0 3 8 ÷ 100

Quotient   Remainder

Hence, 47,038 ÷ 100 gives quotient = 470 and remainder = 38.

(c) 8,90,000 ÷ 100

$$
\begin{array}{r}
8900 \\
100{\overline{\smash{\big)}\,890000}} \\
-800\!\downarrow \\
\hline
900 \\
-900\!\downarrow \\
\hline
00 \\
-00\!\downarrow \\
\hline
00 \\
-00 \\
\hline
0 \\
\hline
\end{array}
$$

8 9 0 0 0 0 ÷ 100

Quotient   Remainder

Hence, 8,90,000 ÷ 100 gives quotient = 8,900 and remainder = 0.

Hence, we observe that,

When a number (dividend) is divided by 100, the quotient is obtained

by removing the tens and ones digits from the number (dividend). The number formed by these last two removed digits is the remainder.

Division By 1,000

Example 3 : Divide : (a) 6,754 by 1,000   (b) 96,579 by 1,000
(c) 4,59,000 by 1,000
What do you observe?

Solution : (a) $6,754 \div 1,000$

$$
\begin{array}{r}
6 \\
1000 \overline{)6754} \\
-6000 \\
\hline
754
\end{array}
$$

$6\,754 \div 1000$

Quotient   Remainder

Hence, $6754 \div 1000$ gives quotient = 6 and remainder = 754.

(b) $96,579 \div 1,000$

$$
\begin{array}{r}
96 \\
1000 \overline{)96579} \\
-9000\downarrow \\
\hline
6579 \\
6000 \\
\hline
579
\end{array}
$$

$9\,6\,579 \div 1000$

Quotient   Remainder

Hence, $96579 \div 1000$ gives quotient = 96 and remainder = 579.

(c) $4,59,000 \div 1,000$

$$
\begin{array}{r}
459 \\
1000 \overline{)459000} \\
-4000\downarrow \\
\hline
5900 \\
-5000\downarrow \\
\hline
9000 \\
-9000 \\
\hline
0
\end{array}
$$

$4\,5\,9\,000 \div 1000$

Quotient   Remainder

Hence, 4,59,000 ÷ 1,000 gives quotient = 459 and remainder = 0.

Hence, we observe that,

When a number (dividend) is divided by 1,000, the quotient is obtained by removing the hundreds, tens and ones digits from the number (dividend). The number formed by these last three removed digits is the remainder.

Exercise - 6(D)

1. Without actually dividing, find the quotient and the remainder :

   (a) 385 ÷ 10   (b) 7,526 ÷ 10   (c) 42,805 ÷ 10

   (d) 54,926 ÷ 10   (e) 2,64,079 ÷ 100   (f) 7,84,800 ÷ 100

   (g) 45,624 ÷ 100   (h) 57,004 ÷ 100   (i) 3,42,000 ÷ 100

   (j) 8,96,400 ÷ 10   (k) 4,92,060 ÷ 100   (l) 65,020 ÷ 10

   (m) 65,003 ÷ 1,000   (n) 3,25,900 ÷ 1,000   (o) 2,78,125 ÷ 1,000

   (p) 4,20,006 ÷ 1,000   (q) 1,20,100 ÷ 1,000   (r) 1,56,009 ÷ 1,000

Word Problems Based On Division

Example 1 : The product of two numbers is 11,424. If one of them is 102, find the other.

Solution : Product of two numbers = 11,424

One number = 102

So, other number = 11,424 ÷ 102
$$= 112$$

Hence, the other number is 112.

$$
\begin{array}{r}
112 \\
102\overline{)11424} \\
-102 \\
\hline
122 \\
-102 \\
\hline
204 \\
-204 \\
\hline
0
\end{array}
$$

Example 2 : 19,600 apples are packed in 56 boxes. How many apples are packed in a box?

Solution : Number of apples packed in 56 boxes = 19,600

Number of apples packed in a box = 19,600 ÷ 56 = 350

$$\begin{array}{r} 350 \\ 56\overline{)19600} \\ -168\downarrow\ | \\ \hline 280\ | \\ -280\downarrow \\ \hline 00 \\ -\ \ 00 \\ \hline 0 \end{array}$$

Hence, 350 apples are packed in a box.

Exercise - 6(E)

1. The cost of 32 pens is ₹ 2,080. Find the cost of a pen.
2. Mrs. Meeta Kapoor withdrew ₹ 6,250 from her bank account. The cashier paid her the money in 50-rupees denominations. How many notes did she get?
3. At a bakery 17,425 pan cakes were produced. They were packed in packets of 14 pan cakes each. How many complete packets can be made? How many pan cakes will be left behind?
4. 65,319 toffees are to be packed in pouches. 52 toffees can be packed in a pouch. How many complete pouches can be packed? How many toffees are left behind?
5. The salary of 36 workers is ₹ 1,98,000. If each worker gets the same salary, find the salary of a worker.
6. A textile mill produced 76,380 m of cloth in the month of October. Find the daily production of the mill assuming that the mill made the same length of cloth every day.
7. The total aeroplane fare of 24 persons is ₹ 2,05,080. What is the fare of one person if fare of each one is same?
8. 98,448 shuttle cocks were packed in containers. Each container contains 18 shuttle cocks. How many containers can be completely packed? How many shuttle cocks will be left behind?
9. How many years are there in 35,770 days? Assume that 1 year =365 days.
10. 73,500 copies of a book were equally packed in 30 bundles. How many copies of the book were packed in each bundle?

Review Of The Chapter

1. Divide and find the quotient and the remainder of each of the following :
   (a) 68,546 ÷ 8   (b) 29,385 ÷ 5   (c) 7,14,268 ÷ 7
   (d) 54,688 ÷ 16   (e) 17,328 ÷ 19   (f) 4,56,283 ÷ 25
   (g) 1,67,580 ÷ 102   (h) 3,71,635 ÷ 145   (i) 8,34,925 ÷ 325

2. Divide and verify your answer :
   (a) 54,255 ÷ 15   (b) 15,938 ÷ 28   (c) 25,890 ÷ 46
   (d) 64,119 ÷ 117   (e) 1,41,685 ÷ 215   (f) 94,978 ÷ 169

3. Without actual dividing, find the quotient and the remainder :
   (a) 429 ÷ 10   (b) 73,184 ÷ 10   (c) 97,093 ÷ 10
   (d) 36,794 ÷ 100   (e) 1,72,097 ÷ 100   (f) 9,42,500 ÷ 100

4. The cost of 23 TV sets is ₹ 2,17,488. Find the cost of one TV set.

5. How many 20-rupees notes can Ravi get for ₹ 1,30,840?

6. A chartered bus starting from New Delhi to Dehradun charged ₹ 19,520 from 61 passengers. How much money was paid by each passenger?

MULTIPLE CHOICE QUESTIONS (MCQs)

1. In 565 ÷ 5 = 113, divisor is :
   (a) 565 ☐   (b) 5 ☐   (c) 113 ☐

2. The number that we get after the division is called the :
   (a) Dividend ☐   (b) Quotient ☐   (c) Remainder ☐

3. The number to be divided is called the :
   (a) Dividend ☐   (b) Divisor ☐   (c) Quotient ☐

4. The number which is left undivided is called the :
   (a) Dividend ☐   (b) Quotient ☐   (c) Remainder ☐

5. In a division problem, quotient is always less than the divisor. Is it true?
   (a) Yes ☐   (b) No ☐   (c) Sometimes ☐

6. In a division problem, remainder is always less than the divisor. Is it true?
   (a) Yes ☐   (b) No ☐   (c) Sometimes ☐

7. In 5,690 ÷ 10, the remainder is :
   (a) 0 ☐   (b) 90 ☐   (c) 690 ☐

8. In 21,543 ÷ 100, the quotient is :
   (a) 2 ☐   (b) 21 ☐   (c) 215 ☐

9. In 1,75,085 ÷ 100, the remainder is :
   (a) 5 ☐   (b) 85 ☐   (c) 5,085 ☐

Fractions

In the previous class, we have learnt about fractional numbers (*i.e.* fractions). Let us recall them.

Fraction

If a whole is divided equally into different parts, each part is called a fraction.

Fraction As Part Of A Whole
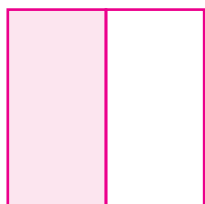
1. Draw a square. Divide it into 2 equal parts. Shade 1 part.

   The shaded part is one-half of the whole. The unshaded part is also one-half of the whole.

   $$\text{One-half} = \frac{1}{2}$$

Thus, in one-half, 1 part out of 2 equal parts is taken.

Hence,

When an object is divided into two equal parts, each part is called 'one-half' of the whole.

2. Draw another square. Divide it into 3 equal parts. Shade 1 part.

   The shaded part is one-third of the whole. Each of the two unshaded parts is also one-third of the whole.
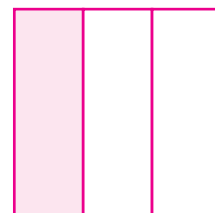
   $$\text{One-third} = \frac{1}{3}$$

Thus, in one-third, 1 part out of 3 equal parts is taken. Hence,

When an object is divided into three equal parts, each part is called 'one-third' of the whole.

Now, shade two parts out of three in the given square.

The shaded part is two-thirds of the whole.

Thus, in two-thirds, 2 parts out of 3 equal parts are taken.
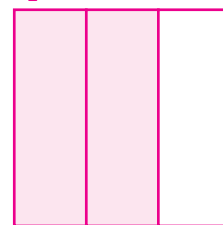
$$\text{Two-thirds} = \frac{2}{3}$$
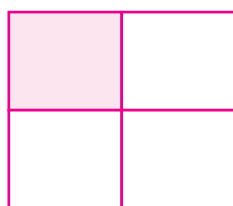
4.

Draw a square. Divide it into 4 equal parts. Shade 1 part.

The shaded part is one-fourth of the whole.

$$\text{One-fourth} = \frac{1}{4}$$

Thus, in one-fourth, 1 part out of 4 equal parts is taken.

Hence,

When an object is divided into four equal parts, each part is called 'one-fourth' or 'quarter' of the whole.

5. Draw a rectangular strip. Divide it into 5 equal parts. Shade 1 part.

The shaded part is one-fifth of the whole. Thus, in one-fifth, 1 part out of 5 equal parts is taken.

$$\text{One-fifth} = \frac{1}{5}$$

Similarly, we may define two-fifths, three-fifths and four-fifths as shown below.

Two-fifths

or

$$\frac{2}{5}$$

Three-fifths

or

$$\frac{3}{5}$$

Four-fifths

or

$$\frac{4}{5}$$
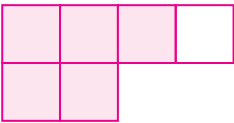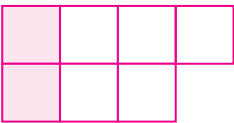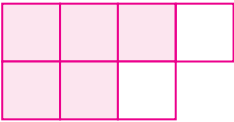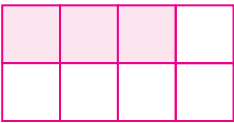
Fractional Numbers And Fractions
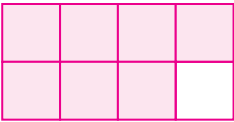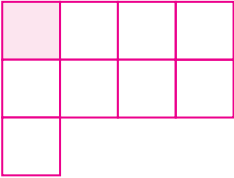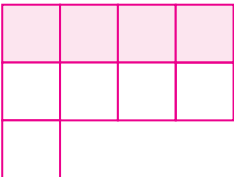
The numbers such as one-half, one-third, two-thirds, one-fourth, one-fifth, two-fifths, three-fifths, etc. are known as fractional numbers and their symbols $\dfrac{1}{2}$, $\dfrac{1}{3}$, $\dfrac{2}{3}$, $\dfrac{1}{4}$, $\dfrac{1}{5}$, $\dfrac{2}{5}$, $\dfrac{3}{5}$, etc. are known as fractions.
Some more examples are given below :

KEEP IN MIND
- *A whole has 4 quarters.*
- *A whole has2 halves.*
- *A half has 2 quarters.*

Figures	Shaded Parts	Fractional Numbers	Fractions
(a)	3 parts out of 4 equal parts	$\dfrac{3}{4}$	Three-fourths or, Three by four or, Three over four
(b)	5 parts out of 6 equal parts	$\dfrac{5}{6}$	Five-sixths or, Five by six or, Five over six
(c)	2 parts out of 7 equal parts	$\dfrac{2}{7}$	Two-sevenths or, Two by seven or, Two over seven
(d)	5 parts out of 7 equal parts	$\dfrac{5}{7}$	Five-sevenths or, Five by seven or, Five over seven
(e)	3 parts out of 8 equal parts	$\dfrac{3}{8}$	Three-eighths or, Three by eight or, Three over eight

(f)	7 parts out of 8 equal parts	$\dfrac{7}{8}$	Seven-eighths or, Seven by eight or, Seven over eight
(g)	1 part out of 9 equal parts	$\dfrac{1}{9}$	One-ninth or, One by nine or, One over nine
(h)	4 parts out of 9 equal parts	$\dfrac{4}{9}$	Four-ninths or, Four by nine or, Four over nine

Exercise : 7(A)

1. Observe the following figures and write the fractions for shaded and unshaded part :
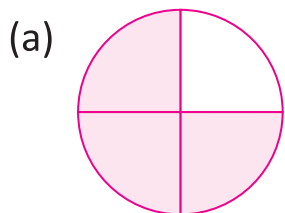
(a)

Shaded =

Unshaded =

(b)

Shaded =

Unshaded =

(c)

Shaded =

Unshaded =

(d)

Shaded =

Unshaded =

(e)

Shaded =

Unshaded =

(f)
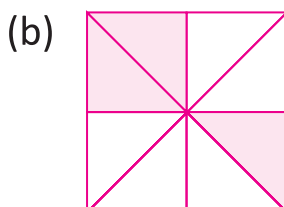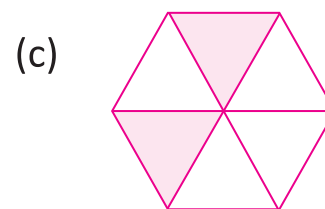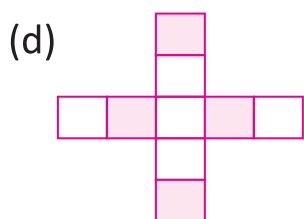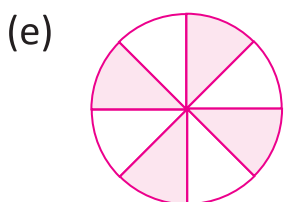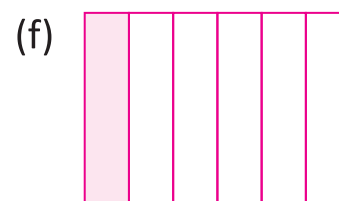
Shaded =

Unshaded =

2. Shade the part of each whole to represent the given fraction :

(a)

$\dfrac{5}{8}$

(b)

$\dfrac{3}{6}$

(c)

$\dfrac{2}{5}$

(d)

$\dfrac{1}{4}$

(e)

$\dfrac{4}{9}$

(f)
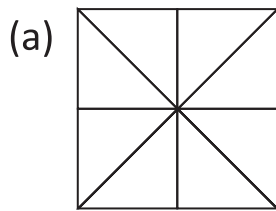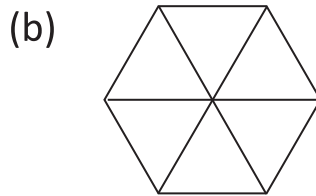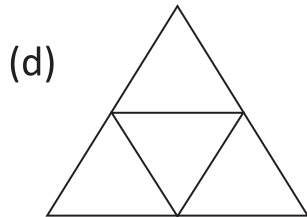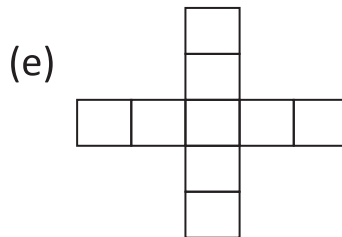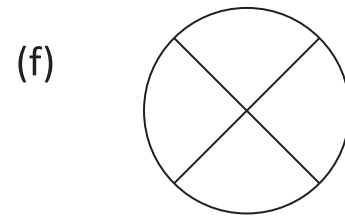
$\dfrac{3}{4}$

3. Draw the following figures. Divide them into different equal parts as given below each figure and shade the given fractional parts :

(a)

Shade $\dfrac{1}{4}$

(b)

Shade $\dfrac{5}{8}$

(c)

Shade $\dfrac{3}{4}$

(d)

Shade $\dfrac{8}{9}$

(e)

Shade $\dfrac{1}{6}$

(f)
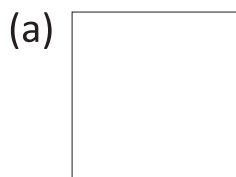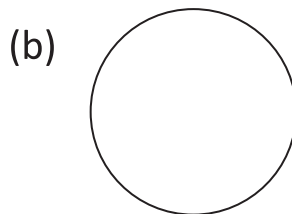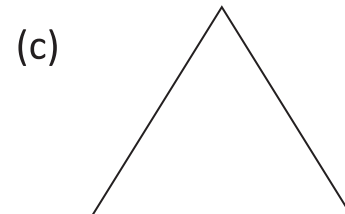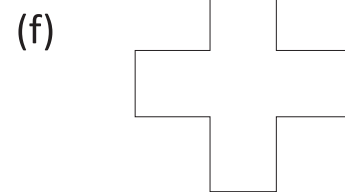
Shade $\dfrac{4}{5}$

4. Write in fractions :

(a) Four-sevenths   = _____   (b) One-eighth   = _____

(c) Two-ninths   = _____   (d) Three-fifths   = _____

(e) Five by six   = _____   (f) Four by nine   = _____

Mathematics 3rd

(g) Nine over eleven = _____ (h) Thirteen by fifteen = _____

(i) Six over seven = _____ (j) One-eleventh = _____

(k) Five-twelfths = _____ (l) Eleven over sixteen = _____

5. Write the following fractions in words :

(a) $\dfrac{7}{9}$ = _____

(b) $\dfrac{5}{8}$ = _____

(c) $\dfrac{11}{13}$ = _____

(d) $\dfrac{14}{15}$ = _____

(e) $\dfrac{8}{17}$ = _____

(f) $\dfrac{3}{11}$ = _____

(g) $\dfrac{6}{19}$ = _____

(h) $\dfrac{1}{10}$ = _____

(i) $\dfrac{6}{25}$ = _____

(j) $\dfrac{9}{11}$ = _____

(k) $\dfrac{2}{21}$ = _____

(l) $\dfrac{8}{19}$ = _____

6. Write as a fraction :

(a) Out of 6 equal parts 1 are taken.   _____

(b) Out of 9 equal parts 4 are taken.   _____

(c) Out of 12 equal parts 7 are taken.   _____

(d) Out of 19 equal parts 3 are taken.   _____

(e) Out of 10 equal parts 9 are taken.   _____

(f) Out of 14 equal parts 11 are taken.   _____

Numerator And Denominator Of A Fraction

A fraction is written with two numbers one over the other and separated by a line. The number above the line is called the numerator of the fraction and the number below the line is called the denominator of the fraction.

For example,

In $\dfrac{2}{7}$, numerator = 2, denominator = 7.

In $\dfrac{1}{8}$, numerator = 1, denominator = 8.

In $\dfrac{4}{15}$, numerator = 4, denominator = 15.

In $\dfrac{7}{11}$, numerator = 7, denominator = 11.

Parts Of A Collection

The figure given alongside is a collection of 6 objects. Draw a dotted line to divide the collection into two equal parts. Then each part represents $\dfrac{1}{2}$. Also, each part contains 3 objects.
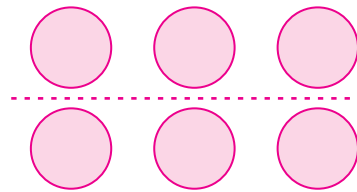
Hence, $\dfrac{1}{2}$ of 6 = 3   or $\dfrac{1}{2} \times 6 = 3$

The figure given alongside is a collection of 9 objects. Draw dotted lines to divide the collection into 3 equal parts. Then each part represents $\dfrac{1}{3}$. Also each part contains 3 objects.
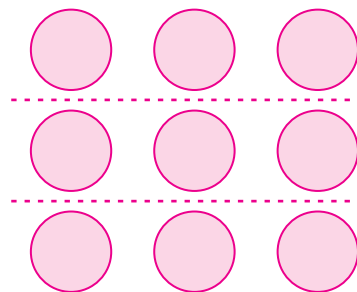
Hence, $\dfrac{1}{3}$ of 9 = 3   or $\dfrac{1}{3} \times 9 = 3$

The figure given alongside contains 12 objects. Draw dotted lines to divide the collection into 3 equal parts. Then each part represents $\dfrac{1}{3}$. Also, each part contains 4 objects.
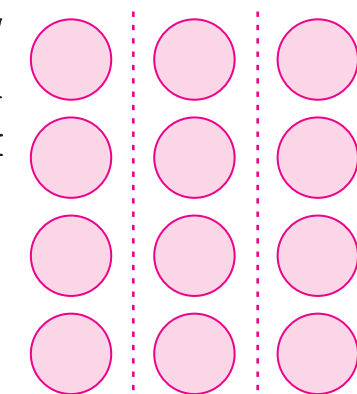
Hence, $\dfrac{1}{3}$ of 12 = 4   or $\dfrac{1}{3} \times 12 = 4$.

Also, 2 parts contain 8 objects.

Hence, $\dfrac{2}{3}$ of 12 = 8   or $\dfrac{2}{3} \times 12 = 8$.

Representation Of Fractions On The Number Line

A number line starts at zero (0) and goes on endlessly to the right. The numbers are marked at equal intervals.

Let us represent $\frac{1}{2}$ on the number line.

Draw a line OP. Set off a line segment OA = 1 unit on OP. Divide OA into two equal parts.

Then each part represents $\frac{1}{2}$ or one-half.

Hence, point B represents $\frac{1}{2}$.

Again, let us represent $\frac{3}{5}$ on the number line.

Draw a line OP. Set off OA = 1 unit on OP. Divide OA into 5 equal parts.

Then each part represents $\frac{1}{5}$.

Starting from 0 take 3 parts to represent $\frac{3}{5}$.
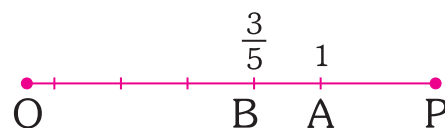
Hence, point B represents $\frac{3}{5}$.

Exercise : 7(B)

1. Write the numerator and the denominator of each of the following :

Fraction	Numerator	Denominator
(a) $\frac{3}{7}$	_____	_____
(b) $\frac{10}{13}$	_____	_____
(c) $\frac{5}{9}$	_____	_____

(d) $\dfrac{11}{14}$ _____ _____

(e) $\dfrac{9}{13}$ _____ _____

(f) $\dfrac{14}{27}$ _____ _____

2. Write the fraction whose :

(a) numerator = 8 and denominator = 11

(b) numerator = 3 and denominator = 7

(c) numerator = 9 and denominator = 13

(d) numerator = 10 and denominator = 21

(e) numerator = 7 and denominator = 9

(f) numerator = 15 and denominator = 16

3. Divide each collection into suitable number of equal parts and fill in the blanks :

(a)

$\dfrac{1}{2}$ of 8 = _____

(b)

$\dfrac{1}{4}$ of 12 = _____

(c)

$\dfrac{1}{3}$ of 9 = _____

(d)
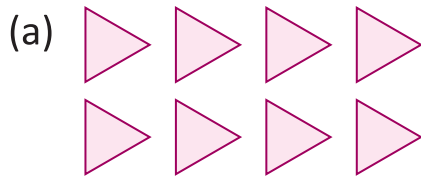
$\dfrac{1}{3}$ of 6 = _____

4. **Fill in the blanks :**

(a) There are _____ halves in a whole.

(b) There are _____ one-third in a whole.

(c) There are _____ quarters in a whole.

(d) There are _____ one-sixth in a whole.

(e) There are _____ quarters in a half.

(f) There are _____ one-fifth in a whole.

5. **Represent each of the following fractions on the number line :**

(a) $\dfrac{1}{7}$ (b) $\dfrac{4}{5}$ (c) $\dfrac{1}{8}$ (d) $\dfrac{3}{4}$

(e) $\dfrac{5}{8}$ (f) $\dfrac{7}{9}$ (g) $\dfrac{1}{4}$ (h) $\dfrac{6}{7}$

6. **Fill in the blanks :**

(a)

```
O        B   A    P
```

B represents _____.

(b)

```
O        C        A    P
```

C represents _____.

(c)

```
O      D    A    P
```

D represents _____.

(d)

```
O              E  A    P
```

E represents _____.

Equivalent Fractions

Observe the following figures carefully :
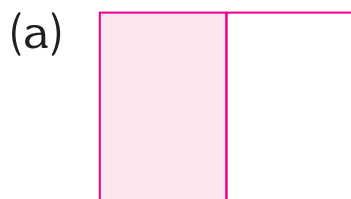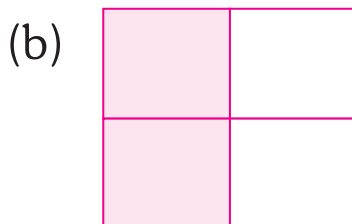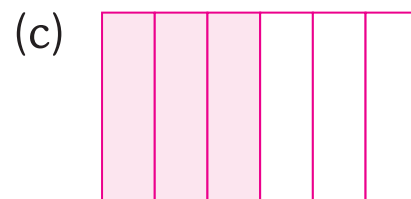
(a) $\dfrac{1}{2}$ (b) $\dfrac{2}{4}$ (c) $\dfrac{3}{6}$

In the figure (a), out of 2, one part is shaded, *i.e.*, $\dfrac{1}{2}$.

In the figure (b), out of 4, two parts are shaded, *i.e.*, $\dfrac{2}{4}$.

In the figure (c), out of 6, three parts are shaded, *i.e.*, $\dfrac{3}{6}$.

As the shaded part compared to the total part is same in each case, therefore the corresponding fractional numbers must also be equal, *i.e.*,

$\dfrac{1}{2} = \dfrac{2}{4} = \dfrac{3}{6}$. So, $\dfrac{1}{2}$, $\dfrac{2}{4}$ and $\dfrac{3}{6}$ are equivalent fractions.

Again, observe the following figures :

(a) (b) (c) (d)
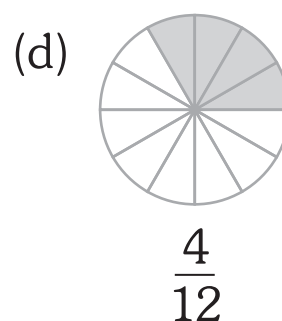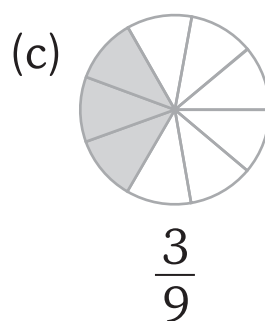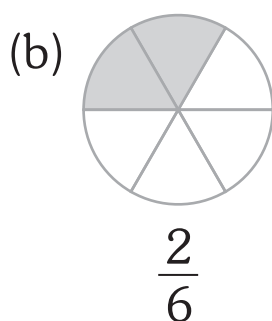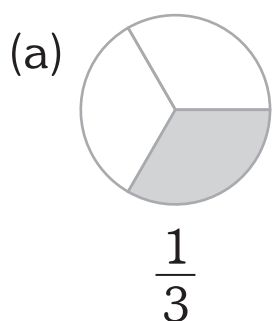
$$\dfrac{1}{3} \qquad \dfrac{2}{6} \qquad \dfrac{3}{9} \qquad \dfrac{4}{12}$$

We observe that the shaded regions in all the circles are proportionately same. So, the fractions represented by these shaded portions are equal, *i.e.*, $\dfrac{1}{3} = \dfrac{2}{6} = \dfrac{3}{9} = \dfrac{4}{12}$.

Hence, $\dfrac{1}{3}, \dfrac{2}{6}, \dfrac{3}{9}$ and $\dfrac{4}{12}$ are equivalent fractions.

Note that $\dfrac{1}{3} = \dfrac{1 \times 2}{3 \times 2} = \dfrac{1 \times 3}{3 \times 3} = \dfrac{1 \times 4}{3 \times 4}$ etc.

Thus,

To get a fraction equivalent to a given fraction, we multiply or divide the numerator and the denominator of the given fraction by the same non-zero number.

Example 1 : Write next three fractions equivalent to $\dfrac{4}{5}$.

Solution : We have :

$$\frac{4}{5} = \frac{4 \times 2}{5 \times 2} = \frac{4 \times 3}{5 \times 3} = \frac{4 \times 4}{5 \times 4}$$

$$\therefore \quad \frac{4}{5} = \frac{8}{10} = \frac{12}{15} = \frac{16}{20}$$

Hence, the next three fractions equivalent to $\frac{4}{5}$ are $\frac{8}{10}$, $\frac{12}{15}$ and $\frac{16}{20}$.

Example 2 : Write four fractions equivalent to $\frac{7}{9}$.

Solution : We have :

$$\frac{7}{9} = \frac{7 \times 2}{9 \times 2} = \frac{7 \times 3}{9 \times 3} = \frac{7 \times 4}{9 \times 4} = \frac{7 \times 5}{9 \times 5}$$

$$\therefore \quad \frac{7}{9} = \frac{14}{18} = \frac{21}{27} = \frac{28}{36} = \frac{35}{45}$$

Hence, the four fractions equivalent to $\frac{7}{9}$ are $\frac{14}{18}$, $\frac{21}{27}$, $\frac{28}{36}$ and $\frac{35}{45}$.

Finding Equivalent Fraction With Given Numerator Or Denominator :

Example 3 : Write an equivalent fraction of $\frac{3}{7}$ with numerator 9.

Solution : Let $\frac{3}{7} = \frac{9}{\ldots}$,

Then, we have to find the missing numeral. To get 9 in the numerator, we multiply 3 by 3, and also 7 by 3.

$$\therefore \quad \frac{3}{7} = \frac{3 \times 3}{7 \times 3} = \frac{9}{21}$$

Hence, $\frac{3}{7}$ and $\frac{9}{21}$ are equivalent fractions.

Example 4 : Write an equivalent fraction of $\frac{16}{20}$ with denominator 5.

Solution : Let $\frac{16}{20} = \frac{\ldots}{5}$.

Then, we have to find the missing numeral.

To get 5 in the denominator, we divide 20 by 4 and also 16 by 4.

$$\therefore \quad \frac{16}{20} = \frac{16 \div 4}{20 \div 4} = \frac{4}{5}$$

Hence, $\frac{16}{20}$ and $\frac{4}{5}$ are equivalent fractions.

Checking For Equivalent Fractions

Two fractions are said to be equivalent if the product of numerator of the first fraction and the denominator of the second fraction is equal to the product of denominator of the first fraction and numerator of the second fraction.

Example 5 : Are the following fractions equivalent?

(a) $\frac{2}{5}$ or $\frac{8}{20}$ 　　　　　　　　　(b) $\frac{6}{7}$ or $\frac{12}{21}$

Solution 　: (a) $\frac{2}{5} \times \frac{8}{20}$

KEEP IN MIND

The method used here is called cross-multiplication method.

$2 \times 20 = 40$

$5 \times 8 = 40$

Both the products are equal.

Hence, $\frac{2}{5}$ and $\frac{8}{20}$ are equivalent fractions.

(b) $\frac{6}{7} \times \frac{12}{21}$

$6 \times 21 = 126$

$7 \times 12 = 84$

Both products are not the same.

Hence, $\frac{6}{7}$ and $\frac{12}{21}$ are not equivalent fractions.

Exercise : 7(C)

1. Write down next 6 equivalent fractions for each of the following :

(a) $\dfrac{1}{5}$ _____ , _____ , _____ , _____ , _____ , _____

(b) $\dfrac{2}{7}$ _____ , _____ , _____ , _____ , _____ , _____

(c) $\dfrac{4}{10}$ _____ , _____ , _____ , _____ , _____ , _____

(d) $\dfrac{8}{9}$ _____ , _____ , _____ , _____ , _____ , _____

(e) $\dfrac{3}{10}$ _____ , _____ , _____ , _____ , _____ , _____

(f) $\dfrac{5}{6}$ _____ , _____ , _____ , _____ , _____ , _____

(g) $\dfrac{1}{8}$ _____ , _____ , _____ , _____ , _____ , _____

(h) $\dfrac{3}{4}$ _____ , _____ , _____ , _____ , _____ , _____

2. Fill in the missing numerators to make the statements true :

(a) $\dfrac{2}{5} = \dfrac{\square}{30}$ (b) $\dfrac{1}{9} = \dfrac{\square}{18}$ (c) $\dfrac{7}{10} = \dfrac{\square}{40}$

(d) $\dfrac{3}{7} = \dfrac{\square}{21}$ (e) $\dfrac{5}{8} = \dfrac{\square}{48}$ (f) $\dfrac{11}{12} = \dfrac{\square}{84}$

3. Fill in the missing denominators to make the statements true :

(a) $\dfrac{9}{13} = \dfrac{18}{\square}$ (b) $\dfrac{3}{8} = \dfrac{15}{\square}$ (c) $\dfrac{6}{7} = \dfrac{30}{\square}$

(d) $\dfrac{7}{15} = \dfrac{21}{\square}$ (e) $\dfrac{8}{9} = \dfrac{56}{\square}$ (f) $\dfrac{4}{7} = \dfrac{16}{\square}$

4. In each of the following, underline which fraction is not equivalent to the others :

(a) $\dfrac{1}{7}, \dfrac{3}{21}, \dfrac{5}{28}, \dfrac{6}{42}, \dfrac{4}{28}$ (b) $\dfrac{1}{5}, \dfrac{2}{10}, \dfrac{10}{50}, \dfrac{3}{15}, \dfrac{4}{10}$

(c) $\dfrac{10}{60}, \dfrac{1}{6}, \dfrac{3}{6}, \dfrac{2}{12}, \dfrac{5}{30}$
(d) $\dfrac{1}{2}, \dfrac{2}{4}, \dfrac{6}{8}, \dfrac{3}{6}, \dfrac{7}{14}$

5. **Check whether the given fractions are equivalent :**

(a) $\dfrac{1}{7}, \dfrac{2}{14}$

(b) $\dfrac{3}{21}, \dfrac{1}{7}$

(c) $\dfrac{10}{20}, \dfrac{2}{10}$

(d) $\dfrac{6}{9}, \dfrac{2}{5}$

(e) $\dfrac{8}{9}, \dfrac{16}{18}$

(f) $\dfrac{7}{14}, \dfrac{3}{6}$

6. **Find an equivalent fraction of $\dfrac{7}{8}$ with :**

(a) numerator 21

(b) numerator 35

(c) denominator 16

(d) denominator 64

7. **Find an equivalent fraction of $\dfrac{14}{42}$ with :**

(a) numerator 7

(b) numerator 2

(c) denominator 84

(d) denominator 126

Types Of Fractions

1. Like And Unlike Fractions :

Observe the following groups of fractions :

(a) $\dfrac{5}{7}, \dfrac{1}{7}, \dfrac{3}{7}, \dfrac{2}{7}, \dfrac{6}{7}$

(b) $\dfrac{2}{5}, \dfrac{1}{8}, \dfrac{3}{4}, \dfrac{7}{9}, \dfrac{5}{6}$

In (a), all the fractions have same denominator, *i.e.*, 7. Such types of fractions are called like fractions.

In (b), all the fractions have different denominators. Such types of fractions are called unlike fractions.

2. Unit Fractions :

If the numerator of a fraction is 1, it is called unit fraction.

For example, $\dfrac{1}{3}, \dfrac{1}{5}, \dfrac{1}{6}, \dfrac{1}{7}, \dfrac{1}{8}$, etc. are unit fractions.

3. Proper and Improper Fractions :

A fraction whose numerator is less than its denominator, is called a proper fraction. For example, $\dfrac{5}{7}, \dfrac{2}{11}, \dfrac{9}{13}, \dfrac{4}{5}$ etc. are proper fractions.

A fraction whose numerator is greater than or equal to its denominator is called improper fraction.

For example : $\dfrac{9}{4}$, $\dfrac{8}{3}$, $\dfrac{11}{5}$, $\dfrac{16}{15}$, $\dfrac{11}{10}$, etc. are improper fractions.

4. Mixed Fractions :

When an improper fraction is written as a combination of a whole number and a proper fraction, it is called a mixed fraction.

For example : $3\dfrac{1}{2}$ is a mixed fraction.

Whole number $\longleftarrow$ $3\dfrac{1}{2}$ $\longrightarrow$ Proper fraction

Also, $2\dfrac{1}{4}$, $6\dfrac{2}{3}$, $4\dfrac{1}{2}$, $10\dfrac{2}{5}$, etc. are mixed fractions.

Conversion Of Mixed Fractions Into Improper Fractions

Let us consider the numeral $3\dfrac{1}{3}$.

$3\dfrac{1}{3}$ means $3 + \dfrac{1}{3}$.

Mixed fraction, $3\dfrac{1}{3}$ = $3 + \dfrac{1}{3}$

$$= \dfrac{3}{1} + \dfrac{1}{3} = \dfrac{3 \times 3}{1 \times 3} + \dfrac{1}{3}$$

$$= \dfrac{9}{3} + \dfrac{1}{3} = \dfrac{10}{3} \text{ (Improper fraction)}$$

Short-Cut Method :

○ Multiply the whole number by the denominator of the proper fraction, i.e., in $3\dfrac{1}{3}$, $3 \times 3 = 9$.

○ Add this product to the numerator of the proper fraction, i.e., $9 + 1 = 10$ (New numerator).

- Write a fraction with new numerator over the denominator.

i.e., $3\dfrac{1}{3} = \dfrac{10}{3}$

Alternatively, we can write the above three steps as follows :

$$3\dfrac{1}{3} = \dfrac{(3 \times 3) + 1}{3} = \dfrac{9 + 1}{3} = \dfrac{10}{3}.$$

Example 1 : Convert $7\dfrac{2}{9}$ and $5\dfrac{1}{6}$ into improper fractions.

Solution : $7\dfrac{2}{9} = \dfrac{(7 \times 9) + 2}{9} = \dfrac{63 + 2}{9} = \dfrac{65}{9}.$

$5\dfrac{1}{6} = \dfrac{(5 \times 6) + 1}{6} = \dfrac{30 + 1}{6} = \dfrac{31}{6}.$

Conversion Of Improper Fractions Into Mixed Fractions

Let us consider an improper fraction $\dfrac{8}{7}$.

We have :

$$\dfrac{8}{7} = \left(\dfrac{1}{7} + \dfrac{1}{7} + \dfrac{1}{7} + \dfrac{1}{7} + \dfrac{1}{7} + \dfrac{1}{7} + \dfrac{1}{7} \right) + \dfrac{1}{7}$$

$$= \dfrac{7}{7} + \dfrac{1}{7}$$

$$= 1 + \dfrac{1}{7} = 1\dfrac{1}{7}$$

Shortcut Method :

Let us convert $\dfrac{8}{7}$ into mixed fraction by a shorter method.

On dividing 8 by 7, we get :

quotient = 1, remainder = 1

That is, 1 whole number and 1 part out of 7.

i.e., 1 whole number and $\frac{1}{7}$.

$$\therefore \quad \frac{8}{7} = 1 + \frac{1}{7} = 1\frac{1}{7}.$$

$$\begin{array}{r} 1 \\ 7\overline{)8} \\ -7 \\ \hline 1 \end{array}$$

Example 2 : Convert the following improper fractions into mixed fractions :

(a) $\frac{25}{7}$

(b) $\frac{158}{9}$

Solution : (a) On dividing 25 by 7, we get :
quotient = 3, remainder = 4
i.e., 3 whole numbers + 4 parts out of 7.

$$\begin{array}{r} 3 \\ 7\overline{)25} \\ -21 \\ \hline 4 \end{array}$$

$$\therefore \quad \frac{25}{7} = 3 + \frac{4}{7} = 3\frac{4}{7}.$$

(b) On dividing 158 by 9, we get :
quotient = 17, remainder = 5
i.e., 17 whole numbers + 5 parts out of 9.

$$\begin{array}{r} 17 \\ 9\overline{)158} \\ -9\downarrow \\ \hline 68 \\ -63 \\ \hline 5 \end{array}$$

$$\therefore \quad \frac{158}{9} = 17 + \frac{5}{9} = 17\frac{5}{9}.$$

Exercise : 7(D)

1. Which of the following are proper fractions?

(a) $\frac{3}{8}$

(b) $\frac{7}{9}$

(c) $\frac{11}{10}$

(d) $\frac{60}{27}$

(e) $\frac{65}{78}$

(f) $\frac{47}{85}$

(g) $\frac{5}{18}$

(h) $\frac{62}{127}$

2. Which of the following are improper fractions?

(a) $\frac{5}{7}$

(b) $\frac{12}{11}$

(c) $\frac{8}{8}$

(d) $\frac{5}{21}$

(e) $\dfrac{27}{8}$ (f) $\dfrac{9}{5}$ (g) $\dfrac{87}{81}$ (h) $\dfrac{6}{7}$

3. Which of the following are unit fractions?

(a) $\dfrac{1}{5}$ (b) $\dfrac{2}{3}$ (c) $\dfrac{1}{6}$ (d) $\dfrac{7}{1}$

(e) $\dfrac{1}{11}$ (f) $\dfrac{5}{5}$ (g) $\dfrac{1}{1}$ (h) $\dfrac{1}{9}$

4. Convert the following mixed fractions into improper fractions :

(a) $3\dfrac{4}{7}$ (b) $5\dfrac{2}{9}$ (c) $8\dfrac{1}{8}$ (d) $6\dfrac{7}{8}$

(e) $1\dfrac{1}{12}$ (f) $3\dfrac{11}{13}$ (g) $9\dfrac{5}{11}$ (h) $1\dfrac{8}{13}$

5. Convert the following improper fractions into mixed fractions :

(a) $\dfrac{27}{6}$ (b) $\dfrac{19}{7}$ (c) $\dfrac{38}{4}$ (d) $\dfrac{95}{4}$

(e) $\dfrac{101}{2}$ (f) $\dfrac{56}{3}$ (g) $\dfrac{89}{10}$ (h) $\dfrac{100}{11}$

Comparison Of Fractions

1. **Comparison of fractions with the same denominator :**
   Observe the following figures :

(a)

(b)
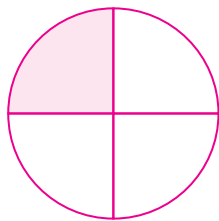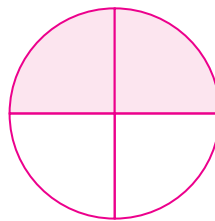
$\dfrac{1}{4}$ is shaded. $\dfrac{2}{4}$ is shaded.

In the figure (a), 1 part out of 4 equal parts is shaded. In the figure (b), 2 parts out of 4 equal parts are shaded. Clearly, shaded parts in the circle (b) are more than that in circle (a).

Thus, $\frac{2}{4} > \frac{1}{4}$ or $\frac{1}{4} < \frac{2}{4}$.

Hence, we observe that,

Between two fractions having the same denominator, the fraction with the greater numerator is greater than the other.

Example 1 : Compare : (a) $\frac{5}{7}$ and $\frac{3}{7}$. (b) $\frac{1}{11}$ and $\frac{5}{11}$.

Solution : (a) Both the fractions have same denominator, i.e., 7.
Since, 5 > 3.

$$\therefore \ \frac{5}{7} > \frac{3}{7} \quad \text{or} \quad \frac{3}{7} < \frac{5}{7}.$$

(b) Both the fractions have same denominator, i.e., 11.
Since, 1 < 5.

$$\therefore \ \frac{1}{11} < \frac{5}{11} \quad \text{or} \quad \frac{5}{11} > \frac{1}{11}.$$

2. Comparison of fractions with the same numerator :

Observe the following figures :

(a)

(b)

$\frac{2}{7}$ is shaded.

$\frac{2}{9}$ is shaded.
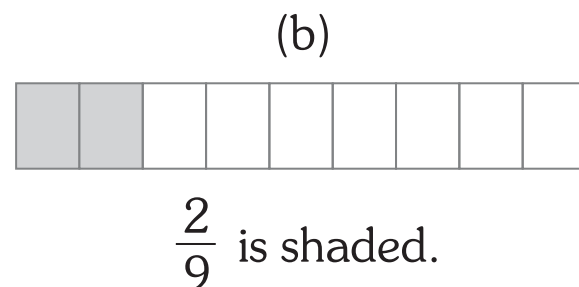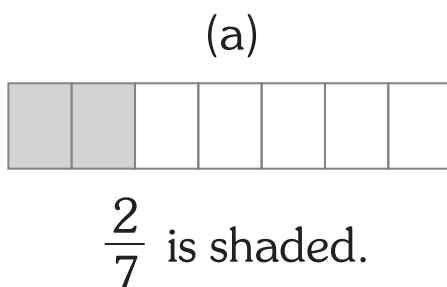
In the figure (a), strip is divided into 7 equal parts and in the figure (b), strip is divided into 9 equal parts. In strip (a), 2 parts out of 7 equal parts are shaded, and in strip (b), 2 parts out of 9 equal parts are shaded. Clearly, the shaded portion in the strip (a) is more than that in the strip (b).

Thus, $\frac{2}{7} > \frac{2}{9}$:

Hence, we observe that,

Between two fractions having the same numerator, the fraction with the smaller denominator is greater than the other.

Example 2 : Compare : (a) $\dfrac{3}{5}$, $\dfrac{3}{11}$ (b) $\dfrac{14}{19}$, $\dfrac{14}{17}$.

Solution : (a) $\dfrac{3}{5}$, $\dfrac{3}{11}$ (b) $\dfrac{14}{19}$, $\dfrac{14}{17}$

Since, $5 < 11$ Since, $19 > 17$

$\therefore \dfrac{3}{5} > \dfrac{3}{11}$ $\therefore \dfrac{14}{19} < \dfrac{14}{17}$

3. Comparison of fractions with unlike numerators and unlike denominators :

To compare two fractions having unlike numerators and unlike denominators, we first convert them into the fractions having same (like) denominator. This can be done by multiplying the numerator and the denominator of each fraction by a suitable number. Then, we compare the fractions as usual.

Example 3 : Compare $\dfrac{1}{3}$ and $\dfrac{2}{5}$.

Solution : Given fractions are $\dfrac{1}{3}$ and $\dfrac{2}{5}$.

$\dfrac{1}{3} = \dfrac{1 \times 5}{3 \times 5} = \dfrac{5}{15}$ [Multiplying the numerator and the denominator by 5]

$\dfrac{2}{5} = \dfrac{2 \times 3}{5 \times 3} = \dfrac{6}{15}$ [Multiplying the numerator and the denominator by 3]

Clearly, $\dfrac{5}{15} < \dfrac{6}{15}$ (as $5 < 6$)

Hence, $\dfrac{1}{3} < \dfrac{2}{5}$

Alternative Method :

$$\frac{1}{3} \diagdown \frac{2}{5}$$ (cross-multiplication)

Now, $1 \times 5 = 5$ and $3 \times 2 = 6$

Since, $5 < 6$.

$\therefore \quad \dfrac{1}{3} < \dfrac{2}{5}$

Exercise : 7(E)

1. Fill in the blanks by putting '>' or '<' in each of the following to make the statement true :

(a) $\dfrac{5}{12} \square \dfrac{7}{12}$

(b) $\dfrac{16}{17} \square \dfrac{11}{17}$

(c) $\dfrac{8}{15} \square \dfrac{2}{15}$

(d) $\dfrac{1}{6} \square \dfrac{5}{6}$

(e) $\dfrac{3}{5} \square \dfrac{3}{16}$

(f) $\dfrac{2}{11} \square \dfrac{2}{9}$

(g) $\dfrac{1}{15} \square \dfrac{2}{15}$

(h) $\dfrac{16}{25} \square \dfrac{16}{23}$

(i) $\dfrac{10}{19} \square \dfrac{5}{19}$

(j) $\dfrac{21}{38} \square \dfrac{21}{16}$

(k) $\dfrac{20}{21} \square \dfrac{11}{21}$

(l) $\dfrac{18}{19} \square \dfrac{7}{19}$

2. Which is greater in each of the following pairs of fractions?

(a) $\dfrac{3}{8}, \dfrac{2}{5}$

(b) $\dfrac{1}{7}, \dfrac{4}{9}$

(c) $\dfrac{10}{17}, \dfrac{5}{16}$

(d) $\dfrac{7}{13}, \dfrac{9}{16}$

(e) $\dfrac{6}{11}, \dfrac{5}{16}$

(f) $\dfrac{7}{11}, \dfrac{5}{21}$

(g) $\dfrac{1}{3}, \dfrac{3}{4}$

(h) $\dfrac{2}{15}, \dfrac{9}{10}$

(i) $\dfrac{3}{5}, \dfrac{7}{15}$

(j) $\dfrac{7}{9}, \dfrac{5}{6}$

(k) $\dfrac{5}{12}, \dfrac{3}{7}$

(l) $\dfrac{1}{9}, \dfrac{5}{8}$

3. Which is smaller in each of the following pairs of fractions?

(a) $\dfrac{4}{7}$, $\dfrac{6}{11}$

(b) $\dfrac{3}{16}$, $\dfrac{9}{20}$

(c) $\dfrac{3}{7}$, $\dfrac{2}{5}$

(d) $\dfrac{8}{9}$, $\dfrac{4}{5}$

(e) $\dfrac{7}{15}$, $\dfrac{1}{5}$

(f) $\dfrac{6}{17}$, $\dfrac{5}{21}$

(g) $\dfrac{4}{5}$, $\dfrac{1}{7}$

(h) $\dfrac{3}{10}$, $\dfrac{7}{8}$

(i) $\dfrac{3}{8}$, $\dfrac{1}{9}$

(j) $\dfrac{2}{7}$, $\dfrac{5}{12}$

(k) $\dfrac{7}{10}$, $\dfrac{9}{11}$

(l) $\dfrac{1}{9}$, $\dfrac{4}{21}$

4. Arrange the following fractions in ascending order :

(a) $\dfrac{1}{5}$, $\dfrac{2}{5}$, $\dfrac{7}{5}$, $\dfrac{3}{5}$, $\dfrac{8}{5}$

(b) $\dfrac{7}{9}$, $\dfrac{2}{9}$, $\dfrac{1}{9}$, $\dfrac{4}{9}$, $\dfrac{5}{9}$

(c) $\dfrac{11}{15}$, $\dfrac{11}{19}$, $\dfrac{11}{17}$, $\dfrac{11}{13}$, $\dfrac{11}{16}$

(d) $\dfrac{9}{11}$, $\dfrac{9}{10}$, $\dfrac{9}{12}$, $\dfrac{9}{15}$, $\dfrac{9}{17}$

5. Arrange the following fractions in descending order :

(a) $\dfrac{7}{19}$, $\dfrac{1}{19}$, $\dfrac{6}{19}$, $\dfrac{4}{19}$, $\dfrac{3}{19}$

(b) $\dfrac{8}{15}$, $\dfrac{7}{15}$, $\dfrac{9}{15}$, $\dfrac{11}{15}$, $\dfrac{2}{15}$

(c) $\dfrac{10}{21}$, $\dfrac{10}{17}$, $\dfrac{10}{19}$, $\dfrac{10}{25}$, $\dfrac{10}{11}$

(d) $\dfrac{15}{16}$, $\dfrac{15}{17}$, $\dfrac{15}{24}$, $\dfrac{15}{22}$, $\dfrac{15}{23}$

Addition Of Fractions

1. Addition Of Fractions With The Same Denominator :

Observe the following figures :

(a)

(b)

(c)

$\dfrac{1}{6}$ is shaded

+

$\dfrac{2}{6}$ is shaded

=
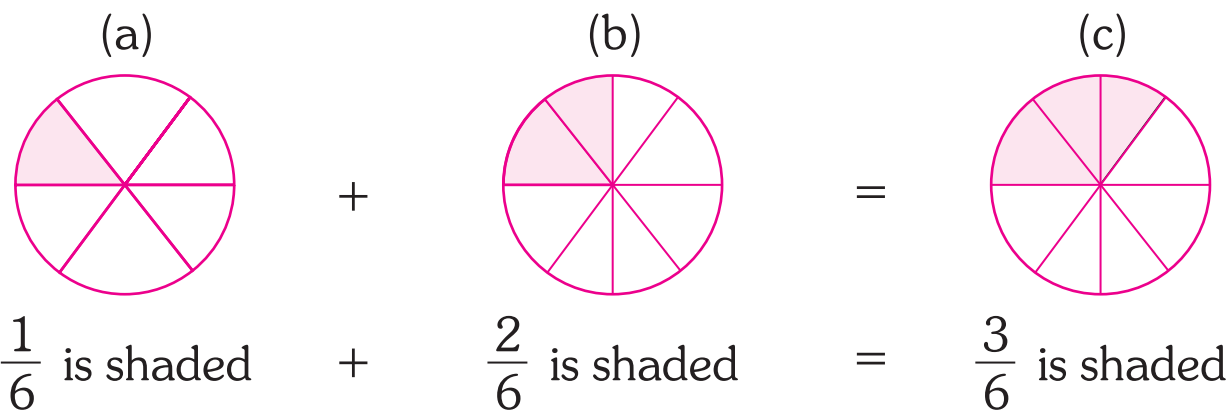
$\dfrac{3}{6}$ is shaded

In the figure (a), $\frac{1}{6}$ of the circle is shaded and in the figure (b), $\frac{2}{6}$ of the circle is shaded. In all we have $\frac{3}{6}$ of the circle shaded.

Hence, $\frac{1}{6} + \frac{2}{6} = \frac{1+2}{6} = \frac{3}{6}$.

Thus, we observe that,

To add the fractions with the same denominator, we simply add their numerators and write the common denominator.

Sum of the like fractions $= \dfrac{\text{Sum of the numerators}}{\text{Common denominator}}$

Example 1 : Find the sum of $\frac{5}{9}$ and $\frac{2}{9}$.

Solution : $\frac{5}{9} + \frac{2}{9} = \frac{5+2}{9} = \frac{7}{9}$.

Example 2 : Find the sum of $\frac{7}{11}, \frac{2}{11}$ and $\frac{1}{11}$.

Solution : $\frac{7}{11} + \frac{2}{11} + \frac{1}{11} = \frac{7+2+1}{11} = \frac{10}{11}$.

2. Addition Of Fractions With The Different Denominators :

To add two or more fractions with unlike denominators, we first convert them into fractions with same (like) denominators by multiplying the numerators and the denominator by the same non-zero number.

Then we add the fractions.

Example 3 : Add $\frac{6}{7}$ and $\frac{3}{5}$.

Solution : $\frac{6}{7} + \frac{3}{5}$

$$\frac{6}{7} = \frac{6 \times 5}{7 \times 5} = \frac{30}{35}$$

$$\frac{3}{5} = \frac{3 \times 7}{5 \times 7} = \frac{21}{35}$$

$$\therefore \frac{6}{7} + \frac{3}{5} = \frac{30}{35} + \frac{21}{35}$$

$$= \frac{30 + 21}{35}$$

$$= \frac{51}{35}$$

Example 4 : Find the sum of $\frac{1}{6}$, $\frac{3}{4}$ and $\frac{1}{24}$.

Solution : $\frac{1}{6} + \frac{3}{4} + \frac{1}{24}$

$$\frac{1}{6} = \frac{1 \times 4}{6 \times 4} = \frac{4}{24}$$

$$\frac{3}{4} = \frac{3 \times 6}{4 \times 6} = \frac{18}{24}$$

$$\frac{1}{24} = \frac{1 \times 1}{24 \times 1} = \frac{1}{24}$$

$$\therefore \frac{1}{6} + \frac{3}{4} + \frac{1}{24} = \frac{4}{24} + \frac{18}{24} + \frac{1}{24}$$

$$= \frac{4 + 18 + 1}{24} = \frac{23}{24}$$

Exercise : 7(F)

1. Add :

(a) $\frac{2}{5} + \frac{1}{5}$ (b) $\frac{7}{11} + \frac{3}{11}$ (c) $\frac{8}{9} + \frac{5}{9}$ (d) $\frac{6}{29} + \frac{5}{29}$

Mathematics 3rd

(e) $\dfrac{9}{22} + \dfrac{1}{11}$ (f) $\dfrac{8}{9} + \dfrac{7}{18}$ (g) $\dfrac{5}{6} + \dfrac{1}{3}$ (h) $\dfrac{6}{11} + \dfrac{3}{14}$

(i) $\dfrac{1}{7} + \dfrac{2}{7} + \dfrac{4}{7}$ (j) $\dfrac{5}{14} + \dfrac{6}{14} + \dfrac{3}{14}$ (k) $\dfrac{7}{24} + \dfrac{6}{24} + \dfrac{9}{24}$ (l) $\dfrac{1}{12} + \dfrac{5}{12} + \dfrac{7}{12}$

(m) $\dfrac{1}{11} + \dfrac{2}{5} + \dfrac{3}{7}$ (n) $\dfrac{1}{5} + \dfrac{3}{8} + \dfrac{9}{10}$ (o) $\dfrac{4}{9} + \dfrac{5}{12} + \dfrac{1}{36}$ (p) $\dfrac{1}{6} + \dfrac{1}{3} + \dfrac{7}{12}$

2. Find the sum of :

(a) $\dfrac{7}{16}$ and $\dfrac{5}{16}$ (b) $\dfrac{2}{13}$ and $\dfrac{5}{13}$ (c) $\dfrac{1}{4}$ and $\dfrac{2}{4}$

(d) $\dfrac{5}{12}$ and $\dfrac{1}{3}$ (e) $\dfrac{1}{8}$ and $\dfrac{3}{4}$ (f) $\dfrac{1}{9}$ and $\dfrac{6}{7}$

(g) $\dfrac{1}{5}, \dfrac{3}{5}$ and $\dfrac{2}{5}$ (h) $\dfrac{1}{5}, \dfrac{3}{10}$ and $\dfrac{3}{8}$ (i) $\dfrac{1}{6}, \dfrac{2}{9}$ and $\dfrac{5}{12}$

(j) $\dfrac{3}{16}, \dfrac{5}{8}$ and $\dfrac{1}{4}$ (k) $\dfrac{5}{11}, \dfrac{2}{3}$ and $\dfrac{1}{7}$ (l) $\dfrac{2}{7}, \dfrac{1}{6}$ and $\dfrac{4}{21}$

Subtraction Of Fractions

1. Subtraction Of Fractions With The Same Denominator :

To subtract fractions with the same (like) denominator, we subtract the smaller numerator from the greater to obtain the numerator of the required fraction. The denominator of the required fraction is the common denominator of the given fractions.

$$\text{Difference of like fractions} = \dfrac{\text{Difference of the numerators}}{\text{Common denominator}}$$

Example 1 : Subtract $\dfrac{3}{8}$ from $\dfrac{7}{8}$.

Solution   : $\dfrac{7}{8} - \dfrac{3}{8} = \dfrac{7-3}{8} = \dfrac{4}{8}$.

2. Subtraction of fractions with the different denominators

To subtract two fractions with different (unlike) denominators, we first convert them into fractions with same denominators by multiplying the numerator and the denominator by the same non-zero number. Then, we subtract the fractions.

Example 2 : Subtract $\frac{1}{11}$ from $\frac{7}{9}$.

Solution : $\frac{1}{11} = \frac{1 \times 9}{11 \times 9} = \frac{9}{99}$

$\frac{7}{9} = \frac{7 \times 11}{9 \times 11} = \frac{77}{99}$

Hence, $\frac{7}{9} - \frac{1}{11} = \frac{77}{99} - \frac{9}{99}$

$= \frac{77-9}{99} = \frac{68}{99}$

Example 3 : Subtract $\frac{9}{10}$ from $\frac{19}{20}$.

Solution : $\frac{9}{10} = \frac{9 \times 2}{10 \times 20} = \frac{18}{20}$

$\frac{19}{20} = \frac{19 \times 1}{20 \times 1} = \frac{19}{20}$

$\frac{19}{20} - \frac{9}{10} = \frac{19}{20} - \frac{18}{20} = \frac{19-18}{20} = \frac{1}{20}$

Exercise : 7(G)

1. Subtract :

(a) $\frac{9}{11} - \frac{3}{11}$ (b) $\frac{3}{5} - \frac{1}{5}$ (c) $\frac{7}{10} - \frac{1}{10}$ (d) $\frac{2}{7} - \frac{1}{7}$

(e) $\dfrac{7}{10} - \dfrac{1}{3}$ (f) $\dfrac{11}{12} - \dfrac{5}{6}$ (g) $\dfrac{9}{13} - \dfrac{2}{5}$ (h) $\dfrac{4}{5} - \dfrac{7}{15}$

(i) $\dfrac{4}{9} - \dfrac{2}{5}$ (j) $\dfrac{5}{21} - \dfrac{4}{21}$ (k) $\dfrac{6}{7} - \dfrac{2}{5}$ (l) $\dfrac{8}{11} - \dfrac{7}{22}$

2. Find the difference between :

(a) $\dfrac{7}{12}$ and $\dfrac{1}{4}$ (b) $\dfrac{8}{9}$ and $\dfrac{3}{8}$ (c) $\dfrac{4}{11}$ and $\dfrac{3}{11}$

(d) $\dfrac{5}{8}$ and $\dfrac{3}{5}$ (e) $\dfrac{5}{9}$ and $\dfrac{6}{7}$ (f) $\dfrac{1}{4}$ and $\dfrac{7}{9}$

(g) $\dfrac{5}{14}$ and $\dfrac{2}{7}$ (h) $\dfrac{1}{5}$ and $\dfrac{3}{10}$ (i) $\dfrac{1}{12}$ and $\dfrac{3}{7}$

Word Problems

Example 1 : Raman took $\dfrac{5}{9}$ hours to paint a chair and $\dfrac{2}{5}$ hours to paint a table. How much time did he take in painting both items?

Solution : Time taken in painting a chair $= \dfrac{5}{9}$ hours

Time taken in painting a table $= \dfrac{2}{5}$ hours

Total time taken $= \dfrac{5}{9}$ hours $+ \dfrac{2}{5}$ hours

$$= \dfrac{5}{9} + \dfrac{2}{5}$$

$$= \dfrac{5 \times 5}{9 \times 5} + \dfrac{2 \times 9}{5 \times 9} = \dfrac{25}{45} + \dfrac{18}{45}$$

$$= \dfrac{25 + 18}{45} = \dfrac{43}{45} \text{ hours}$$

Hence, Raman took $\dfrac{43}{45}$ hours in painting both items.

Example 2 : Teena bought $\dfrac{5}{6}$ m of ribbon and Preeti bought $\dfrac{1}{3}$ m of ribbon. Who bought longer ribbon and by how much?

Solution : Teena's ribbon is $\dfrac{5}{6}$ m long and Preeti's ribbon is $\dfrac{1}{3}$ m long.

We compare $\dfrac{5}{6}$ and $\dfrac{1}{3}$ to find who bought the longer ribbon.

$$\dfrac{5}{6} = \dfrac{5 \times 1}{6 \times 1} = \dfrac{5}{6}$$

$$\dfrac{1}{3} = \dfrac{1 \times 2}{3 \times 2} = \dfrac{2}{6}$$

In $\dfrac{5}{6}$ and $\dfrac{2}{6}$, $5 > 2$. So, $\dfrac{5}{6} > \dfrac{2}{6}$

Thus, $\dfrac{5}{6} > \dfrac{1}{3}$.

Hence, Teena bought longer ribbon.

We find the difference of $\dfrac{5}{6}$ and $\dfrac{1}{3}$ to find how much longer Teena's ribbon is.

$$\dfrac{5}{6} - \dfrac{1}{3} = \dfrac{5}{6} - \dfrac{2}{6} = \dfrac{5-2}{6} = \dfrac{3}{6}$$

Hence, Teena's ribbon is longer than Preeti's by $\dfrac{3}{6}$ m.

Exercise : 7(H)

1. In a long jump contest, Jenny jumped $2\dfrac{5}{6}$ m and Tinny jumped $2\dfrac{2}{5}$ m. Who made a longer jump? How much more did one jump than the other?

2. An empty container weighs $\frac{3}{7}$ kg. Nitin put $\frac{5}{6}$ kg spices in the container. What is the total weight of the container and the spices together?

3. Mrs. Geeta bought $1\frac{1}{5}$ kg potatoes, $2\frac{1}{6}$ kg tomatoes and $3\frac{5}{9}$ kg onions. What was the total quantity of vegetables she bought?

4. Find the difference between the sum of $5\frac{5}{8}$ and $3\frac{4}{7}$ and the sum of $7\frac{4}{5}$ and $2\frac{1}{7}$.

5. Mr. Mukesh filled $\frac{7}{8}$ litres of petrol in his bike in the morning. In the evening, $\frac{1}{5}$ litres of petrol was left in the bike. How much petrol was consumed?

6. What must be added to $\frac{7}{20}$ to get $\frac{19}{15}$?

7. A tin contained $16\frac{3}{8}$ litres of oil. $1\frac{2}{5}$ litres of oil is used and $2\frac{1}{3}$ litres of oil leaked out. How much oil is left in the tin?

8. Anny had a chocolate and gave $\frac{1}{8}$ of it to her little brother and $\frac{2}{7}$ of the same to her best friend. What fraction of chocolate did she give away and what fraction is still left with her?

Review Of The Chapter

1. Write the following fractions in words :

(a) $\frac{3}{7}$ (b) $\frac{2}{9}$ (c) $\frac{8}{11}$ (d) $\frac{5}{6}$

2. Write the fraction whose :

(a) numerator = 7 and denominator = 10

(b) numerator = 9 and denominator = 14

(c) numerator = 13 and denominator = 17

(d) numerator = 21 and denominator = 32

3. Fill in the missing numbers to make the statements true :

(a) $\frac{3}{8} = \frac{\square}{24}$ (b) $\frac{15}{20} = \frac{3}{\square}$ (c) $\frac{8}{9} = \frac{\square}{18}$

(d) $\dfrac{11}{22} = \dfrac{\square}{2}$ (e) $\dfrac{25}{45} = \dfrac{\square}{9}$ (f) $\dfrac{1}{5} = \dfrac{6}{\square}$

4. Write three equivalent fractions for each of the following :

   (a) $\dfrac{7}{9}$ (b) $\dfrac{2}{7}$ (c) $\dfrac{1}{11}$ (d) $\dfrac{4}{15}$

5. Convert the following mixed fractions into improper fractions :

   (a) $2\dfrac{5}{8}$ (b) $1\dfrac{1}{5}$ (c) $3\dfrac{2}{7}$ (d) $4\dfrac{1}{10}$

6. Fill in the blanks by putting > or < in the given spaces :

   (a) $\dfrac{2}{7} \square \dfrac{5}{9}$ (b) $\dfrac{1}{8} \square \dfrac{4}{7}$ (c) $\dfrac{1}{3} \square \dfrac{3}{8}$

   (d) $\dfrac{5}{11} \square \dfrac{3}{11}$ (e) $\dfrac{6}{19} \square \dfrac{6}{20}$ (f) $\dfrac{5}{7} \square \dfrac{9}{10}$

7. Add :

   (a) $\dfrac{7}{12} + \dfrac{3}{12}$ (b) $\dfrac{5}{11} + \dfrac{3}{11}$ (c) $\dfrac{8}{9} + \dfrac{1}{5}$

   (d) $\dfrac{4}{6} + \dfrac{3}{5}$ (e) $\dfrac{8}{15} + \dfrac{1}{5}$ (f) $\dfrac{4}{9} + \dfrac{5}{7}$

8. Subtract :

   (a) $\dfrac{5}{12} - \dfrac{5}{16}$ (b) $\dfrac{3}{9} - \dfrac{1}{12}$ (c) $\dfrac{1}{17} - \dfrac{7}{34}$

   (d) $\dfrac{2}{5} - \dfrac{1}{10}$ (e) $\dfrac{1}{12} - \dfrac{1}{20}$ (f) $\dfrac{3}{7} - \dfrac{4}{20}$

MULTIPLE CHOICE QUESTIONS (MCQs)

1. $\dfrac{3}{17}$ can be read as :

   (a) Three-seventeen $\square$ (b) Three-seventeenths $\square$ (c) None of these $\square$

2. $\dfrac{5}{9}$ can be read as :

   (a) Nine over five $\square$ (b) Five over nine $\square$ (c) None of these $\square$

3. Which of the following groups is a group of like fractions?

(a) $\dfrac{3}{7}, \dfrac{2}{5}$ ☐   (b) $\dfrac{8}{9}, \dfrac{1}{9}$ ☐   (c) $\dfrac{7}{11}, \dfrac{7}{12}$ ☐

4. Which of the following groups is a group of unit fractions?

(a) $\dfrac{1}{8}, \dfrac{1}{7}$ ☐   (b) $\dfrac{3}{7}, \dfrac{2}{7}$ ☐   (c) $\dfrac{5}{1}, \dfrac{5}{9}$ ☐

5. Which of the following is a proper fraction?

(a) $\dfrac{7}{9}$ ☐   (b) $3\dfrac{11}{13}$ ☐   (c) $\dfrac{15}{11}$ ☐

6. Which of the following is an improper fraction?

(a) $\dfrac{3}{2}$ ☐   (b) $1\dfrac{1}{5}$ ☐   (c) $\dfrac{7}{19}$ ☐

7. Which of the following is a mixed fraction?

(a) $\dfrac{7}{11}$ ☐   (b) $\dfrac{12}{5}$ ☐   (c) $4\dfrac{3}{5}$ ☐

8. $3\dfrac{5}{7}$ can be written as :

(a) $3 + \dfrac{5}{7}$ ☐   (b) $3 - \dfrac{5}{7}$ ☐   (c) Both of these ☐

9. ⊕ represents :

(a) $\dfrac{4}{1}$ ☐   (b) $\dfrac{1}{4}$ ☐   (c) $\dfrac{4}{4}$ ☐

10. ▭ represents :

(a) $\dfrac{6}{5}$ ☐   (b) $\dfrac{5}{6}$ ☐   (c) None of these ☐

11. Which is greater : $\dfrac{3}{7}$ or $\dfrac{2}{7}$?

(a) $\dfrac{3}{7}$ ☐   (b) $\dfrac{2}{7}$ ☐   (c) Both are equal ☐

12. Which is smaller : $\dfrac{5}{9}$ or $\dfrac{5}{11}$?

(a) $\dfrac{5}{9}$ ☐   (b) $\dfrac{5}{11}$ ☐   (c) Both are equal ☐

Measurement

In earlier class, we have discussed about measuring lengths, mass and capacity. Now, we will discuss more facts in details.

In our daily life we measure length *i.e.*, how long and short an object is?

We measure mass *i.e.*, how heavier or lighter an object is?

We measure capacity of liquid or container, like how much liquid can be kept in one particular container? Or how much one container can store? The system, we use to measure, is called METRIC SYSTEM OF MEASUREMENT. METRIC SYSTEM OF MEASUREMENT is a decimal system which uses multiples of ten for converting various units in the system.

In metric system, to measure length, we use centimetre (cm), metre (m) and kilometre (km).

To measure weight (mass), we use gram (g) and kilogram (kg) as units.

To measure capacity, we use litre (*l*) and millilitre (*ml*) as units.

Units Of Lengths

Higher Units			Standard Unit	Lower Units		
(km)	(hm)	(dam)	(m)	(dm)	(cm)	(mm)
kilometre	hectome--tre	decame--tre	metre	decimetre	centimetre	millimetre

1 km = 1000 m		$1 \text{ dm} = \dfrac{1}{10} \text{ m} = 0.1 \text{ m}$
1 hm = 100 m	m	$1 \text{ cm} = \dfrac{1}{100} \text{ m} = 0.01 \text{ m}$
1 dam = 10 m		$1 \text{ mm} = \dfrac{1}{1000} \text{ m} = 0.001 \text{ m}$

Units Of Weight

Higher Units			Standard Unit	Lower Units		
(kg)	(hg)	(dag)	(g)	(dg)	(cg)	(mg)
kilogram	hectogr-am	decagr-am	gram	decigram	centigr-am	milligram

1 kg = 1000 g 1 hg = 100 g 1 dag = 10 g	g	$1 \, dg = \dfrac{1}{10} \, g = 0.1 \, g$ $1 \, cg = \dfrac{1}{100} \, g = 0.01 \, g$ $1 \, mg = \dfrac{1}{1000} \, g = 0.001 \, g$

Units Of Capacity

Higher Units			Standard Unit	Lower Units		
(kl)	(hl)	(da$l$)	(l)	(dl)	(cl)	(ml)
kilolitre	hectoli-tre	decali-tre	litre	decilitre	centili-tre	millilitre

1 kl = 1000 l 1 hl = 100 l 1 da$l$ = 10 l	l	$1 \, dl = \dfrac{1}{10} \, l = 0.1 \, l$ $1 \, cl = \dfrac{1}{100} \, l = 0.01 \, l$ $1 \, ml = \dfrac{1}{1000} \, l = 0.001 \, l$

Prefix	Kilo	Hecta	Deca	Deci	Centi	Milli
Abbreviation	(k)	(h)	(da)	(d)	(c)	(m)
Meaning	thousand	hundred	ten	tenth	hundredth	thousandth
Value	1000	100	10	$\dfrac{1}{10}$	$\dfrac{1}{100}$	$\dfrac{1}{1000}$

Measurement Of Length

To measure any distance means measurement of length whether it is small distance or long distance and by knowing lengths, we can compare two lengths.

As we discuss, kilometre is the higher unit of measurement, used for measuring long distance and millimetre is the smallest unit of measurement for small distances/lengths.

$$1 \text{ km} = 1000 \text{ m} \qquad\qquad 1 \text{ cm} = 10 \text{ mm}$$

To understand look into the following :

0.003 km = 0.03 hm = 0.3 dam = 3 m = 30 dm

$$= 300 \text{ cm} = 3000 \text{ mm.}$$

We use decimals, for writing the bigger units.

0.003 km = 3000 mm as well.

0.3 dam = 3000 mm as well.

0.03 hm = 30 dm, etc.

Thus, to measure the distances we use ruler as per the requirement and keep zero of the ruler at one end and stretch to the other end. Reading of ruler at the other end is the actual measure of distance.

In general, we use millimetres to measure very small lengths.

Relating metre to other units

Kilometre (km)   m ÷ 1000

Hectometre (hm)   m ÷ 100   → (More than a metre)

Decametre (dam)   m ÷ 10

Metre (m)

Decimetre (dm)   (m × 10)

Centimetre (cm)   (m × 100) →   (Less than a metre)

Millimetre (mm)   (m × 1000)

Relating All Units Of Lengths

$\times 10$ $\times 10$ $\times 10$ $\times 10$ $\times 10$ $\times 10$

km   hm   dam   m   dm   cm   mm

Bigger Unit   Smaller Unit

Bigger Unit   Smaller Unit

km   hm   dam   m   dm   cm   mm

$\div 10$ $\div 10$ $\div 10$ $\div 10$ $\div 10$ $\div 10$
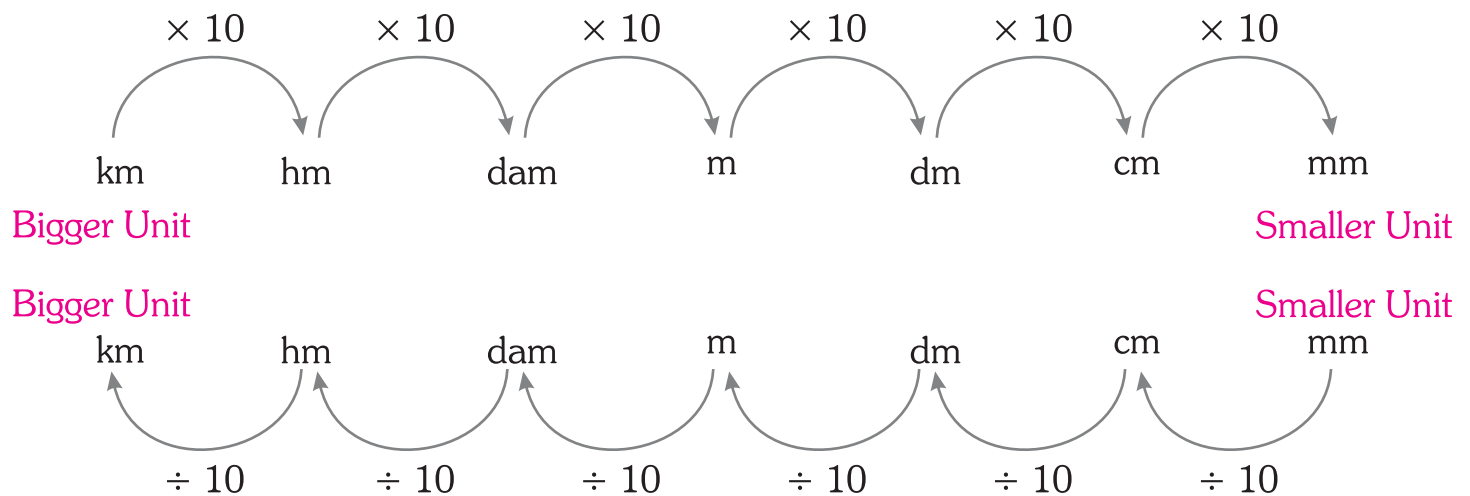
Example 1 : Write 13.8 km into hm.

Solution   : 13.8 km

= 13.8 × 10 hm

= 138 hm

Example 2 : Write 57 mm into cm.

Solution   : 57 mm

= 50 mm + 7 mm

57 mm   = 50 mm + 7 mm

$= 50 \times \dfrac{1}{10}\,cm + 7 \times \dfrac{1}{10}\,cm$

= 5 cm + 0.7 cm

= 5.7 cm

Example 3 :   Write 8 cm and 5 mm into millimetre.

Solution   :   8 cm 5 mm = 8 cm + 5 mm = 8 × 1 cm + 5 mm

= 8 × 10 mm + 5 mm = 80 mm + 5 mm

= 85 mm

Using decimals to express length : To understand look into the following. Let us take the height of a tree as 7 m 45 cm.

To express the height of the tree in the bigger unit using decimals, we have

$$7 \text{ m } 45 \text{ cm} = 7 \text{ m} + 45 \text{ cm}$$
$$= 7 \text{ m} + 45 \times \frac{1}{100} \text{ m} = 7 \text{ m} + 0.45 \text{ m}$$
$$= 7.45 \text{ m}$$

And to express the height of the tree in smaller unit, we have

$$7 \text{ m } 45 \text{ cm} = 7 \text{ m} + 45 \text{ cm}$$
$$= 7 \times 100 \text{ cm} + 45 \text{ cm} = 700 \text{ cm} + 45 \text{ cm}$$
$$= 745 \text{ cm}$$

Example : Convert the following :

(a) 8 km into m.

$$8 \text{ km} = 8 \times 1000 \text{ m} = 8000 \text{ m}$$

(b) 6.725 m into m and mm

$$= 6 \text{ m} + 0.725 \text{ m}$$
$$= 6 \text{ m} + 0.725 \times 1000 \text{ mm} = 6 \text{ m} + 725 \text{ mm}$$
$$= 6 \text{ m } 725 \text{ mm}$$

(c) 2525 m into hm and m.

$$2525 \text{ m} = 2525 \div 100 \text{ hm} = 25.25 \text{ hm}$$
$$= 25 \text{ hm} + 0.25 \text{ hm} = 25 \text{ hm} + 25 \text{ m} = 25 \text{ hm } 25 \text{ m}$$

(d) 9405 m into km and m

9405 m = 9000 m + 405 m

= 9000 ÷ 1000 km + 405 m = 9 km + 405 m

= 9 km 405 m

(e) 27.27 dam into dm.

= 27.27 × 100 dm = 2727 dm

(f) 19.508 hm into m and cm.

= 19.508 × 100 m = 1950.8 m

= 1950 m + 0.8 m = 1950 m + 0.8 × 100 cm

= 1950 m + 80 cm = 1950 m 80 cm

Relationship Between Units Of Lengths

$$1 \text{ km} = 10 \text{ hectometres (hm)}$$
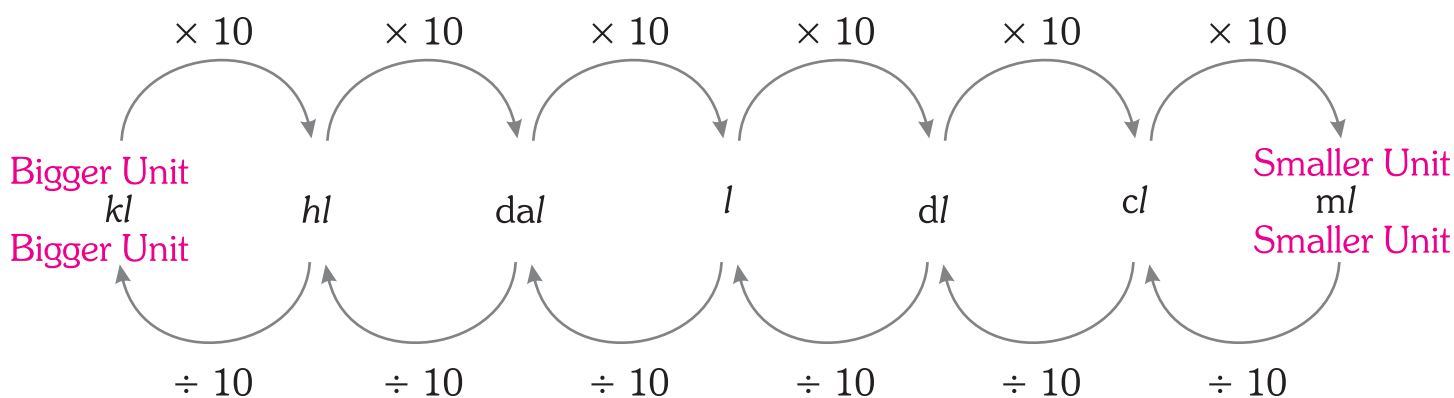$$1 \text{ hectometre} = 10 \text{ decametres (dam)}$$
$$1 \text{ decametre} = 10 \text{ metres (m)}$$
$$1 \text{ metre} = 10 \text{ decimetres (dm)}$$
$$1 \text{ decimetre} = 10 \text{ centimetres (cm)}$$
$$1 \text{ centimetre} = 10 \text{ millimetres (mm)}$$

Shortcut for conversion between units.

Example : Convert 715 cm into m.

1. Place ones digit, that is 5, below cm column and the other digits in sequence.

km	hm	dam	m	dm	cm	mm
			7	1	5	

2. Place the decimal point just after the required unit, that is m.

km	hm	dam	m	dm	cm	mm
			7 .	1	5	

Thus, 715 cm = 7.15 m.

Example : Convert 32.45 m into km.

1. Place ones digit, that is 2, below m column and the other digits in sequence.

km	hm	dam	m	dm	cm	mm
		3	2	4	5	

2. Shift the decimal point to the place immediately after the required unit, that is km. Put zeroes

km	hm	dam	m	dm	cm	mm
0 .	0	3	2	4	5	

Thus, 32.45 m = 0.03245 km.

Exercise - 8(A)

1. **Fill in the blanks :**

   (a) Height of plant = 180 cm = _____ m.

   (b) Circumference of glass = 18 mm = _____ cm.

   (c) Width of Cricket bat = 32 cm = _____ mm.

   (d) Length of Cricket bat = 42 cm = _____ dm.

   (e) Diameter of plate = 35 cm = _____ m.

   (f) Height of room = 0.32 m = _____ cm.

   (g) A distance of 4.7 km is equal to _____ m.

   (h) 1,000 m long field equal to _____ km.

   (i) 2725 m long football field equal to _____ cm.

   (j) Distance of window from floor = 32 cm = _____ m.

2. **Convert**

   (a) 18 m 25 cm into cm

   (b) 68.24 hm into dm

   (c) 3.6 dam into m

   (d) 7845 m into hm and m

   (e) 72.64 hm into dm

   (f) 3 hm into dam

(g) 7.825 m into m and mm   (h) 5.05 km into km and m

(i) 408 cm into m and cm   (j) 28.75 dm into dam

(k) 3.6 dam into m   (l) 4825 mm into m and mm.

3. Complete the table.

	Full Form	In Bigger Units	In Smaller Units
(a)	5 km 500 m		
(b)	17 km 84 m		
(c)	23 km 726 m		
(d)		40.5 km	
(e)			25804 m
(f)	4 m 11 cm		
(g)	9 cm 7 mm		

4. Fill in the blanks :

(a) 5 dam = _____ km   (b) 3 dam = _____ dm

(c) 2 hm = _____ m   (d) 1 dm = _____ mm

(e) 1 dam = _____ dm   (f) 6 km = _____ dam

(g) 1 cm = _____ dm   (h) 5 dm = _____ mm

(i) 7 cm = _____ dm

Operations Involving Units Of Length

Example 1 : Add 28 km 526 m and 14 km 780 m.

Solution   : Without Conversion   With Conversion

$$
\begin{array}{rr}
km & m \\
28 & 526 \\
+14 & 780 \\
\hline
43 & 306
\end{array}
$$

$$
\begin{array}{rl}
28.526 & km \\
+14.780 & km \\
\hline
43.306 & km
\end{array}
$$

Example 2 : Subtract 14 m 45 cm from 22 m 35 cm.

Solution : **Without Conversion** **With Conversion**

m	c m
2 2	3 5
− 1 4	4 5
7	9 0

```
  22.35 m
− 14.45 m
   7.90 m
```

Example 3 : The cost of 1 m of cloth is ₹ 15. Find the cost of 38 m 26 cm cloth.

Solution : Cost of 1 m cloth = ₹ 15

Cost of 38 m 26 cm or 38.26 m cloth

$= ₹ 15 × 38.26$

```
  38 . 26
   × 15
573 . 90
```

Thus, the cost of 38 m 26 cm cloth is ₹ 573.90.

Example 4 : A bus travels 783 km 976 m in 12 hours. Find the distance it travels in 1 hour.

Solution : Distance travelled by bus in 12 hours = 783 km 976 m

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\ = 783.976$ km

```
      65.331
12 ) 783.976
    − 72
      63
     − 60
       39
     − 36
        37
      − 36
        16
      − 12
         4
```

Distance travelled by bus in 1 hour

$\qquad\qquad\qquad\qquad\qquad\qquad\qquad = 783.976$ km $÷ 12$

Thus, distance travelled by the bus in 1 hour is 65.331 km or 65 km 331 m.

Exercise - 8(B)

1. Solve :
   (a) 26 km 280 m + 16 km 790 m.　　(b) 39 m 210 mm + 23 m 435 mm.
   (c) 14 m 45 cm + 50 m 85 cm + 18 m 9 cm.

(d)   10 km 310 m – 6 km 528 m.   (e)   78 m 5 dm × 8.

(f)   5 km 345 m × 15.   (g)   542 m 4 cm ÷ 12.

(h)   187 km 125 m ÷ 5.

2.   680 equal parts are cut from a cloth 87766 m 25 cm long. What is the length of 1 part and 37 parts.

3.   Length of three different ropes is 64 m 124 cm, 54 m 70 cm and 38 m 14 cm. Find the total length.

4.   9.75 m of cloth is required to stitch a suit. Find the length of cloth required to stitch 88 suits.

5.   The distance between house and school is 15 km 300 m. Her father drops her up to 13 km 680 m by scooter and she covers the remaining distance on foot. Find the distance she walks.

6.   A road 87.928 km long has to be constructed 18.926 km and 28.265 km long stretches have been completed. How much of the road is still left to be constructed.

7.   989 m 90 cm of rope is to be packed in bundles. If 13 bundles are to be made, how much rope will there be in each bundle.

Measurement Of Weight

Table of units of weight from higher unit to lower unit.

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
kilogram	hectogram	deca-gram	gram	deci-gram	centigram	milligram

————Higher Units——— ——— Unit ——— ———Lower Units———

Relationship between units of weight

$$1 \text{ kg} = 10 \text{ hectograms (hg)}$$

$$1 \text{ hectogram} = 10 \text{ decagrams (dag)}$$

$$1 \text{ decagram} = 10 \text{ grams (g)}$$

$$1 \text{ gram } = 10 \text{ decigrams (dg)}$$

$$1 \text{ decigram } = 10 \text{ centigrams (cg)}$$

$$1 \text{ centigram } = 10 \text{ milligrams (mg)}$$

Conversion between units of weight
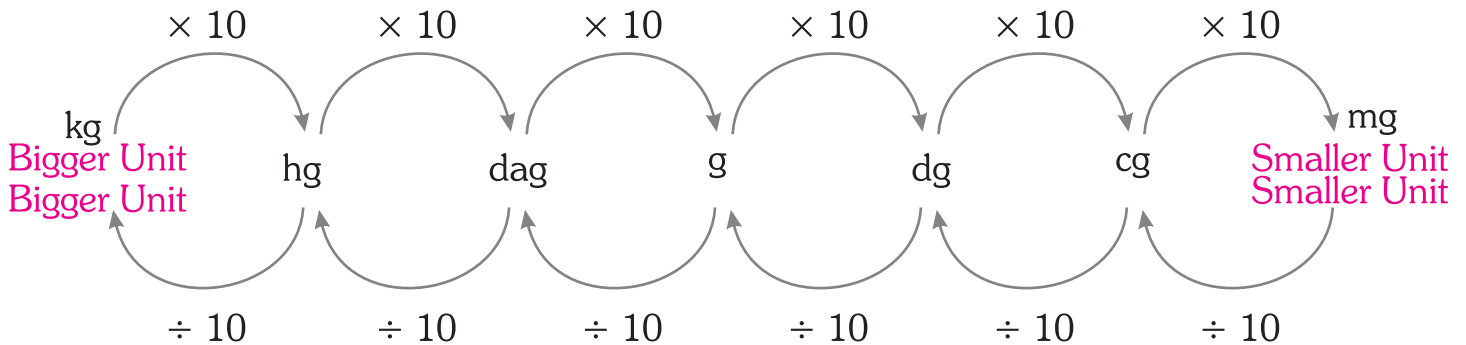
Example : Convert the following :

(a) 18 dag 400 dg into dg.

= 18 dag + 400 dg = 18 × 100 dg + 400 dg

= 1800 dg + 400 dg = 2200 dg

(b) 9 kg into g.

9 × 1000 g = 9000 g

(c) 8.5 dg into cg.

8.5 × 10 cg = 85 cg

(d) 9.08 g into dg and cg.

9.08 g = 9 g + 0.08 g

= 9 × 10 dg + 0.08 × 100 cg = 90 dg + 8 cg

= 90 dg 8 cg

(e) 4.93 hg into hg and g.

4.93 hg = 4 hg + 0.93 hg

= 4 hg + 0.93 × 100 g = 4 hg + 93 g = 4 hg 93 g

Example : Convert the following :

(a) 1350 g into kg and g.

$1350 \text{ g} = 1000 \text{ g} + 350 \text{ g}$

$1 \text{ kg} + 350 \text{ g} = 1 \text{ kg } 350 \text{ g}$

(b) 68 cg into dag.

$68 \text{ cg} = 68 \div 1000 \text{ dag} = 0.068 \text{ dag}$

(c) 956 cg into hg.

$956 \text{ cg} = 956 \div 10000 \text{ hg} = 0.0956 \text{ hg}.$

Shortcut for conversion between units

Example : Convert 809 g into cg and g.

1.   Place ones digit, that is 9, below cg column and the other digits in sequence.

kg	hg	dag	g	dg	cg	mg
			8	0	9	

2.   Place the decimal point after the required unit that is.

kg	hg	dag	g	dg	cg	mg
			8	. 0	9	

Thus, 809 g = 8 g 9 cg.

Example : Covert 375 g into mg.

1.   Place ones digit that is 5, below g column and the other digits in sequence.

kg	hg	dag	g	dg	cg	mg
	3	7	5			

2.   Place the zeroes till the required unit, that is mg.

kg	hg	dag	g	dg	cg	mg
	3	7	5	0	0	0

Thus, 375 g = 375000 mg.

Operations Involving Units Of Weight

Example 1 : Add 28 kg 830 g and 24 kg 350 g.

Solution : Without Conversion

kg	g
28	830
+ 24	350
53	180

With Conversion

$$28.830 \text{ kg}$$
$$+ 24.350 \text{ kg}$$
$$53.180 \text{ kg}$$

Example 2 : Subtract 48 g 658 mg from 78 g 586 mg.

Solution : Without Conversion

g	mg
78	586
− 48	658
29	928

With Conversion

$$78.586 \text{ g}$$
$$- 48.658 \text{ g}$$
$$29.928 \text{ g}$$

Example 3 : A bottle holds 1 kg 650 g of jam. How much jam will be there in 52 such bottles?

Solution : Quantity in 1 bottle = 1 kg 650 g = 1.650 kg.

Quantity in 52 bottles = 1.650 × 52 kg.

Therefore, 85.700 kg in 52 bottles.

$$1.650$$
$$\times 52$$
$$3.200$$
$$+ 82.500$$
$$85.700$$

Example 4 : Rohit bought 24 packets of pulses weighing 216 kg 800 g. Find the weight of one packet of pulses.

Solution : Weight of 24 packets = 216 kg 800 g

= 216.800 kg.

Thus, the weight of one packet of pulses is 9.033 kg or 9 kg 3 gm.

```
        9.033
  24) 216.800
     − 216
         80
        − 72
          80
         − 72
           80
          − 72
            80
```

Exercise - 8(C)

1. Find the weight in gram :
   (a) 0.325 kg   (b) 3.7 kg   (c) 7.25 kg   (d) 2.7 kg

2. Convert :
   (a) 5 kg 80 g into g   (b) 986.7 dg into mg
   (c) 450 g 256 mg into mg   (d) 48.293 kg into kg and g

3. Convert :
   (a) 1290 g into kg and g   (b) 7.894 dag into kg
   (c) 5683 dg into dag   (d) 5298 dg into g and dg

4. Find the weight in kg :
   (a) 400 g   (b) 1140 g   (c) 680 g   (d) 6750 g

5. Fill in the blanks :
   (a) 235 kg = _____ g   (b) 684 dg = _____ mg
   (c) 5 mg = _____ cg   (d) 487 dg = _____ kg
   (e) 439 hg = _____ dg   (f) 2247 mg = _____ g
   (g) 72.8 g = _____ mg   (h) 889 mg = _____ cg
   (i) 70 cg = _____ dag   (j) 565 dg = _____ cg

6. Solve the following :
   (a) 34 kg 531 g + 83 kg 289 g   (b) 82 g 623 mg − 64 g 412 mg
   (c) 21.508 g + 26.314 g + 68.896 g   (d) 58.105 g − 29.520 g

7. A box weighs 68 kg 74 g. What will be the weight of 95 such boxes?

8. A bag of sugar, a bag of rice and a bag of wheat together weigh 52 kg 357 g. If the bag of wheat weighs 28 kg 375 g and the bag of sugar weighs 16 kg 987 g. What is the weight of the bag of rice? Express the answer in kilograms.

9. 64798.3 kg of coal was mined in a year. Equal quantity was sold to 92 shops. How much coal was sold to each shop?

10. Rahul weighs 52.5 kg and Divya weighs 48 kg. By how much is Rahul's weight more than Divya?

11. Ajay bought 24 packets of pulses weighing 218 kg 900 g. Find the weight of

one packet of pulses.

12. Deepu bought 3 kg 650 g apple, 4 kg 825 g banana and 5 kg 575 g papaya. Find the total weight of the fruits that Deepu bought.

Measurement Of Capacity

Table of units of capacity from higher unit to lower unit is shown below :

Thousands	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
1000	100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
kilolitre	hectolitre	deca-litre	litre	deci-litre	centilitre	millilitre

——————Higher Units—————— ——————Unit—————— ——————Lower Units——————

Relationship Between Units Of Capacity

$$1 \text{ kilolitre} = 10 \text{ hectolitres (h}l)$$

$$1 \text{ hectolitre} = 10 \text{ decalitres (da}l)$$

$$1 \text{ decalitre} = 10 \text{ litres } (l)$$

$$1 \text{ litre} = 10 \text{ decilitres (d}l)$$

$$1 \text{ decilitre} = 10 \text{ centilitres (c}l)$$

$$1 \text{ centilitre} = 10 \text{ millilitres (m}l)$$

Conversion between units of capacity

$\times 10 \qquad \times 10 \qquad \times 10 \qquad \times 10 \qquad \times 10 \qquad \times 10$

Bigger Unit
kl hl dal l dl cl Smaller Unit ml
Bigger Unit   Smaller Unit

$\div 10 \qquad \div 10 \qquad \div 10 \qquad \div 10 \qquad \div 10 \qquad \div 10$

Example : Convert the following :

        (a) 8 l into ml.

            8 l = 8 × 1000 ml = 8000 ml

        (b) 3 kl 25 l into l.

            3 kl 25 l = 3 kl + 25 l = 3 × 1000 l + 25 l

            = 3000 l + 25 l = 3025 l

        (c) 1.413 km into dal.

            1.413 km = 1.413 × 100 dal = 141.3 dal

        (d) 2.875 dal into l and cl.

            2.875 dal = 2 da$l$ + 0.875 da$l$

            = 2 × 10 l + 0.875 × 1000 cl = 20 l + 875 cl

            = 20 l 875 cl

Example : Convert the following :

        (a) 4040 l into kl.

            4040 l = 4040 ÷ 1000 kl = 4.040 kl

        (b) 8706 cl into hl.

            8706 cl = 8706 ÷ 10000 hl = 0.8706 hl

        (c) 323 dl into da$l$ and dl.

            323 dl = 300 dl + 23 dl = 300 ÷ 100 da$l$ + 23 dl

            = 3 da$l$ + 23 dl = 3 da$l$ 23 dl

Shortcut for conversion between units

Example : Convert 1678.5 l into kl.

1.   Place ones digit, that is 8, below l column and the other digits in sequence.

kl	hl	da$l$	l	dl	cl	ml
1	6	7	8	5		

2. Shift the decimal point to the place immediately after the required unit that is k*l*.

k*l*	h*l*	da*l*	*l*	d*l*	c*l*	m*l*
1 .	6	7	8	5		

Thus, 1678.5 *l* = 1.6785 k*l*.

Example : Convert 867 *ml* into da*l*.

1. Place ones digit, that is 7, below *ml* column and the other digits in sequence.

k*l*	h*l*	da*l*	*l*	d*l*	c*l*	m*l*
				8	6	7

2. Place the decimal point after the required unit. That is dal and put zeroes if required.

k*l*	h*l*	da*l*	*l*	d*l*	c*l*	m*l*
		0 .	0	8	6	7

Thus, 867 *ml* = 0.0867 dal

Operations involving units of capacity

Example 1 : 14 *l* 280 *ml* of Orange juice and 18 *l* 830 *ml* Carrot juice were mixed together. 22 *l* 756 *ml* of the mixture was used. How much of the mixture is left?

Solution : Quantity of Orange juice = 14 *l* 280 *ml*
= 14.280 *l*
Quantity of Carrot juice = 18 *l* 830 *ml*
= 18.830 *l*

$$\begin{array}{r} 14.280\ l \\ +18.830\ l \\ \hline 33.110\ l \end{array}$$

Total quantity of the mixture
= 14.280 *l* + 18.830 *l*
= 33.110 *l*

Quantity of mixture used = 22 *l* 756 *ml*

$$= 22.756 \, l$$

Quantity of mixture left = 33.110 *l* – 22.756 *l*

Quantity of mixture left = 10.354 *l*

$$= 10 \, l \, 354 \, ml$$

```
  33.110 l
 -22.756 l
  10.354 l
```

Thus, the quantity of mixture left is 10 *l* 354 *ml*.

Example 2 : 280 *l* 496 *ml* milk is filled equally in 46 containers. How much milk is filled in each container? Also, find the quantity of milk in 16 such containers.

Solution : Quantity of milk in 46 containers = 280 *l* 496 *ml*

$$= 280.496 \, l$$

Total number of containers = 46

Quantity of milk in each container

$$280.496 \div 46$$
$$= 6.097 \, l = 6 \, l \, 097 \, ml$$

Quantity of milk in 16 containers

$$= 6 \, l \, 097 \, ml \times 16$$
$$= 6.097 \, l \times 16$$
$$= 97.552 \, l = 97 \, l \, 552 \, ml$$

```
        6.097
   46)280.496
      -276
        449
       -414
         356
        -322
          34
```

```
   6.097
 ×    16
 36.582
+60970
 97.552
```

Thus, each container contains 6 *l* 097 *ml* of milk and 16 containers contain 97 *l* 552 *ml* of milk.

Exercise - 8(D)

1. Fill in the blanks :

   (a) 37 k*l* = _____ *l* = _____ *ml*

(b) 20.75 l = _____ dl = _____ ml

(c) 4702 cl = _____ dal = _____ hl

(d) 2345 dl = _____ hl = _____ kl

(e) 739 cl = _____ l = _____ kl

(f) 3.251 dal = _____ l = _____ cl

2. Fill it :

(a) 0.4 l = _____ ml

(b) 0.7 dal = _____ l

(c) 384 ml = _____ cl

(d) 0.04 ml = _____ cl

(e) 1842 ml = _____ l

(f) 10.6 kl = _____ l

3. Convert :

(a) 3294 hl into kl and l

(b) 35 dl 4 cl into cl

(c) 46.25 l into ml

(d) 3.489 kl into dal

(e) 4.9 hl into hl and cl

(f) 10456 dal into dl and cl

4. Convert :

(a) 5342 l into kl

(b) 3002 ml into l and ml

(c) 2689 dl into hl and dl

(d) 6408 cl into l and dal

(e) 84.56 dl into l

(f) 192.5 dal into kl and l

5. Compare using <, > or = :

(a) 7 kl _____ 700 l

(b) 56 cl _____ 560 ml

(c) 26 cl _____ 260 dal

(d) 8.25 l _____ 8025 ml

(e) 435 ml _____ 0.43 l

(f) 2.5 hl _____ 25 kl

6. Solve :

(a) 64 l 380 ml + 62 l 890 ml

(b) 54 l 60 cl + 45l 89 cl + 19l + 78 cl

(c) 243 kl 480 l − 232 kl 498 l

(d) 63 cl 3 ml − 54 cl 5 ml

7. A tank contains 19 l 385 ml of water. It can still hold 5 l 832 ml of water. Find the capacity of tank.

8. A can of 24 l of oil was purchased for a function. After the function 16 l 325 ml of oil was left in the can. How much oil was used for the function?

9. A container can hold 26 l 280 ml of water. 36 such containers can fill up a tank. Find the capacity of the tank. Express the answer in litres.

10. A man sold 4558.46 l to milk in 15 days. How much milk did he sell in a day?

11. 5292.86 *l* of petrol is stored in 42 tanks. How much oil is stored in each tank and in 17 tanks?

12. A shopkeeper has 100 *l* of oil in a drum. If he sells 8 *l* 250 *ml*, 23 *l* 725 *ml* and 35 *l* 565 *ml* to three customers, how much oil will be left? Express the answer in litres.

Review Of The Chapter

1. Fill in the blanks :
   (a) 15 kg = _____ g
   (b) 3.5 g = _____ mg
   (c) 170 cg = _____ g
   (d) 5.07 mg = _____ g
   (e) 560 *ml* = _____ c*l*
   (f) 0.235 kg = _____ g

2. Convert :
   (a) 47.39 km into hm and m
   (b) 4.89 kg into kg and g
   (c) 9.73 dg to hg
   (d) 5069 *ml* into *l* and *ml*
   (e) 312.5 dm into dam
   (f) 4.09 *l* into d*l* and c*l*

3. A taxi covers 9646.24 km in 24 days. Assuming that it covers equal distance each day, find the distance covered in 15 days.

4. A bag containing potatoes, tomatoes and onions weighs 36 kg 50 g. If the weight of potatoes is 16 kg 825 g and the weight of tomatoes is 9 kg 450 g. What is the weight of the onions? Express the answer in kilograms.

5. 248 *l* 345 *ml* of milk and 228 *l* 780 ml of syrup were mixed together and the mixture was filled in 154 bottles. How much mixture is filled in each bottle?

6. 280 *l* 496 *ml* milk is filled in 46 containers. How much milk is filled in each container? Also find the quantity of milk in 12 such containers.

7. A box weighs 92 kg 80 g. What will be the weight of 95 such boxes?

8. A bottle holds 5 kg 750 g of juice. How much juice will there be in 28 such bottles?

9. Add 21 kg 730 g and 14 kg 350 g.

10. 550 equal parts are cut from a cloth 9776 m 25 cm long. What is the length of each part and 58 parts?

11. 8.75 m of cloth is required to stitch a suit. Find the length of cloth required to stitch 70 suits.

12. Lengths of three different ropes are 32 m 72 cm, 27 m 35 cm and 19 m 7 cm. Find the total length.

13. One egg has a mass of 65 g. How many eggs will be there in 1 kg 300 g?

14. A water bottle contains about 1600 ml of water, how many glasses of 200 ml can be filled by the water in bottle?

15. A transport has 5 cartons of 3.75 kg each, how many carton will he have if there is total weight of 52.5 kg?

16. A frog jumps 3 cm at a time. How many jumbs a frog will take to cover a distance 171 cm?

MULTIPLE CHOICE QUESTIONS (MCQs)

1. 1 hg = _____ g.
   (a) 10 ☐ (b) 100 ☐ (c) 1000 ☐

2. 1 mm = _____ m.
   (a) $\dfrac{1}{10}$ ☐ (b) $\dfrac{1}{100}$ ☐ (c) $\dfrac{1}{1000}$ ☐

3. 1 cm = _____ mm.
   (a) 10 ☐ (b) 100 ☐ (c) 1000 ☐

4. 1 km = _____ hm.
   (a) 10 ☐ (b) 100 ☐ (c) 1000 ☐

5. 1 kg = _____ g.
   (a) 10 ☐ (b) 100 ☐ (c) 1000 ☐

6. 375 g = _____ mg.
   (a) 3750 ☐ (b) 37500 ☐ (c) 375000 ☐

7. 1 *kl* = _____ *hl*.
   (a) 10 ☐ (b) 100 ☐ (c) 1000 ☐

8. 4 *kl* 20 *l* = _____ *l*.
   (a) 420 ☐ (b) 4020 ☐ (c) 42000 ☐

9. 7050 *l* = _____ k*l*.
   (a) 705 ☐ (b) 70.50 ☐ (c) 7.050 ☐

10. 8.05 g = _____ dg _____ cg.
   (a) 80;5 ☐ (b) 8;50 ☐ (c) 8;05 ☐

Basic Geometry

'Geometry' word consists of Geo and metry. Geo means 'earth' and metry means 'measurment', that means measurement on earth. Geometry provides various shapes and figures.

To understand various shapes and figures there are some basics which we will discuss in this chapter.

Point : When a dot is marked on the paper, it represents a point. A point shows an exact location. It is denoted by a capital letter.

• P

Plane : Plane is a surface. In our daily life, floor of the room, table, door sides, etc., are the examples of a plane. A point lies in a plane. It has two properties :

1. Indefinite number of lines can pass through one point.
2. One and only one line can pass through two points.

1.

2.

P   Q
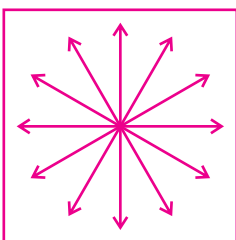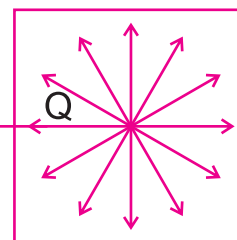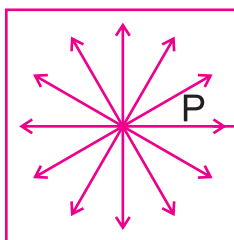
Line : A line can be extended in both directions. A line has no end point and no definite length. In this figure, A and B are two points of the line AB.

A ●————————————————————● B
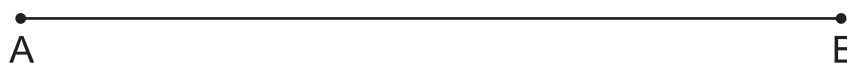
Line AB is written as $\overleftrightarrow{AB}$ or $\overleftrightarrow{BA}$.

The arrow in this figure shows that the line extends in both the sides.

Line Segment : The straight path between two points is called line segment. A line segment is a part of a line. These two points are called the end points.

In this figure, A and B are the two end points of the line segment AB.

A   B

Thus, line segment AB is written as $\overline{AB}$ or $\overline{BA}$.

> **KEEP IN MIND**
> 1. *If points are close or near to each other, line segment will always be straight.*
> 2. *Line segment AB can also be called as BA.*

Ray : A line segment which extends in one direction is called a ray. It has one end point or initial point, but it does not have a definite length.

A
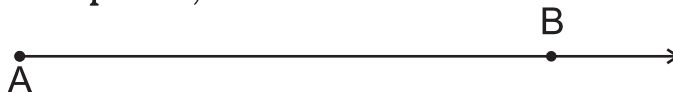
In this figure, A is the end point of the ray AB.

For Example :

1. Name plate is an example of line segment, a four line segment joins and forms the shape.

2. Ignited match-stick flashes light all around, but in a particular direction it flashes more light, which is an example of ray.

3. Ignited match-stick can also be an example of a point flashing light all around in all directions.

> **KEEP IN MIND**
> *Ray can be extended in only one direction.*

Examples : Look at the figures :
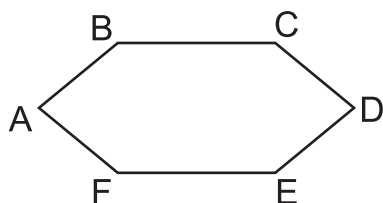
(a) Line segments   (b) Lines   (c) Rays
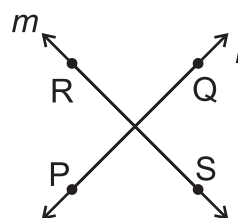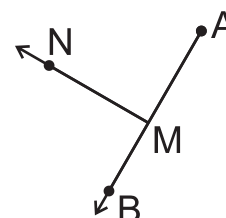
(a) Line segments are $\overline{AB}$, $\overline{BC}$, $\overline{CD}$, $\overline{DE}$, $\overline{EF}$, and $\overline{FA}$.

(b) Lines are $\overleftrightarrow{PQ}$ and $\overleftrightarrow{RS}$ or line *l* and line m.

(c) Rays are $\overleftrightarrow{AB}$ and $\overleftrightarrow{MN}$.

Angle : When two rays meet at a point, then inclination of one ray to the other is called an angle.

We can define an angle as the rotation of two rays.

So, two rays having one common end form an angle.
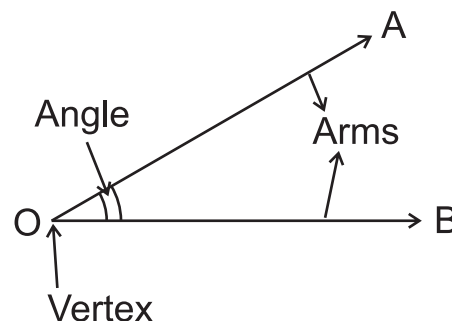
The common end point (O) is the 'Vertex' and the rays (OA and OB) are the 'arms' of the angle.

The symbol for an angle is '∠'. Thus the angle AOB is written as ∠AOB. The vertex is always written in the middle of the other words. An angle can be named in different ways.
∠AOB or ∠BOA.
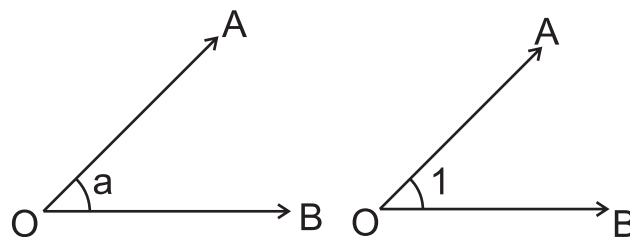
Measuring Angles : The unit of measuring an angle is degree, denoted by the symbol (°). The protractor is divided into 180 equal divisions, each division represents one degree.
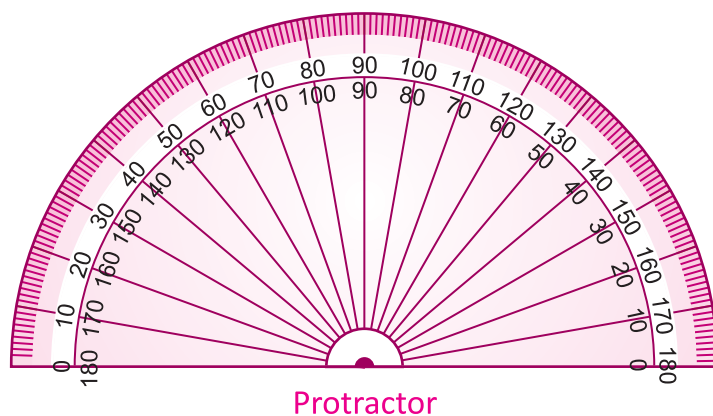
Protractor

To measure an angle in degree, we use a protractor. There are two scales on a protractor, inner scale and outer scale. Inner scale has 0° to 180° in anticlockwise direction and outer scale has 0° to 180° in clockwise direction. The line segment joining 0° and 180° marks is

called the base line of the protractor. The mid point of the base line is called the centre of the protractor.

Example : Measure ∠ABC with a protractor.

1. Place the centre of the protractor on the vertex B and adjust the protractor's base line with the arm BC.

2. Look for the scale with the arm BC points to 0°. Here arm BC points to 0° on the inner scale.

3. Read the scale at that point where the arm BA crosses the scale. BA crosses the inner scale at 60°.

    ∠ABC = 60°

The inner scale is read from right to left while the outer scale is read from left to right.
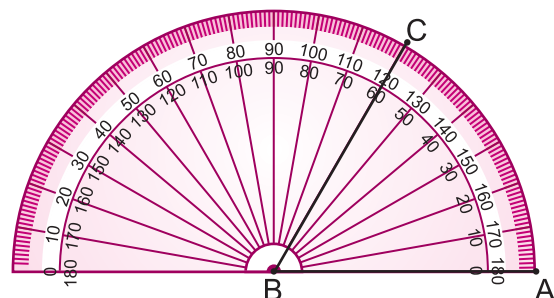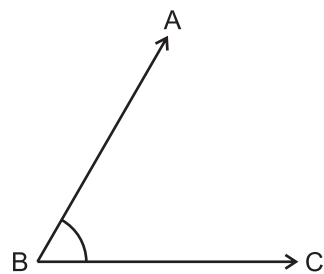
KEEP IN MIND

Always read that scale where the arm coinciding with the base line points to zero.

Exercise - 9(A)

1. Name the following figures :

    (a)

    (b)

    (c)

    (d)

    (e)

    (f)
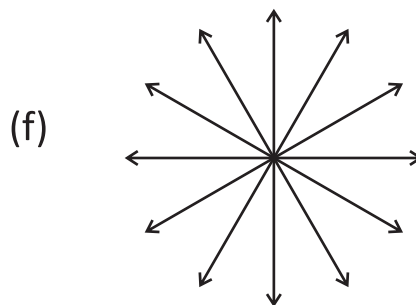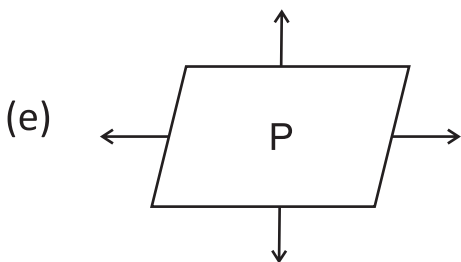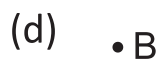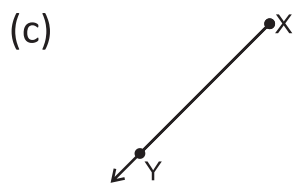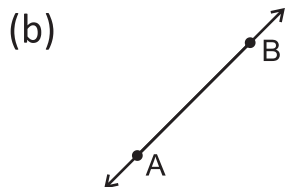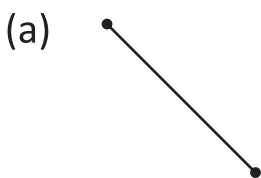
2. Represent the following :

(a) $\overleftrightarrow{AB}$ (b) $\overrightarrow{MN}$ (c) $\overline{PQ}$ (d) Point A

(e) Plane X

3. Draw a hexagon by taking all sides equal. Measure all angles. Join their ends and form as many triangles as you can.

Measure the angles of each triangle.

Is there any four sided figure you can from ? If possible, do it and measure each angle of 4 sided figure.

4. Use 2 match-sticks and draw the sketch of all possible angles.

5. Use 6 match-sticks and form different shapes. Measure the angles in each case. Are they different from the previous ones? Observe the given shape:
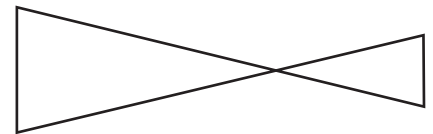
Are you finding any of the angles equal? Which are those pairs? Write separately all the pairs.

6. Tick the figure that represents angle :

(a)   (b)   (c)   (d)
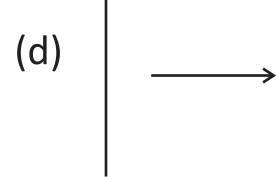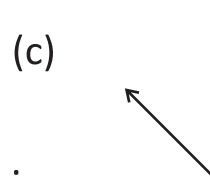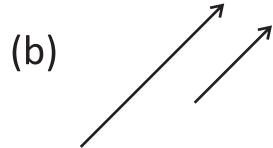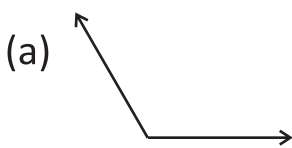
7. (i) Name each angle in different ways :

(a)   (b)   (c)   (d)
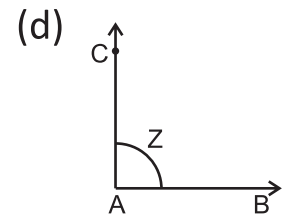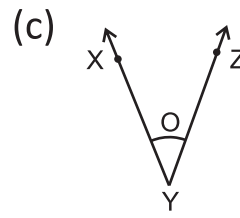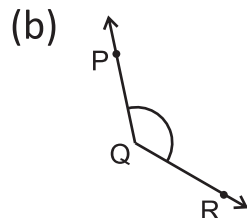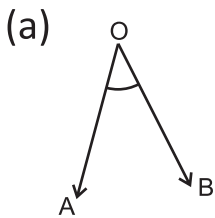
(ii) Name the vertex and the arms of each of the angles shown above.

8. Name all the angles :

(a)   (b)   (c)
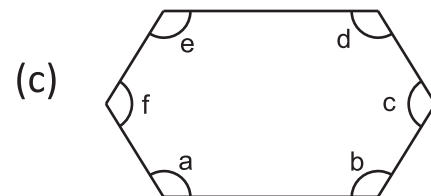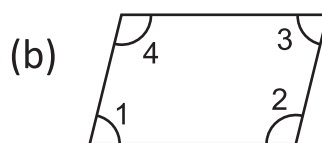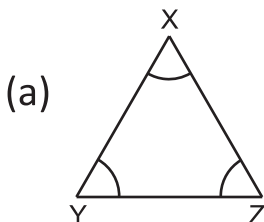
9. Measures the angles using a protractor :

(a)   (b)   (c)   (d)
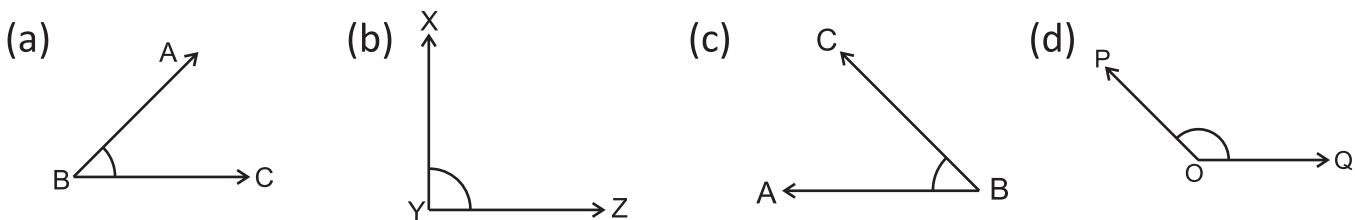
10. Measure the angles in the figure given below :

(a) ∠AOB

(b) ∠AOE

(c) ∠AOD

(d) ∠BOC

(e) ∠BOE

(f) ∠BOD

(g) ∠AOC

(h) ∠COD

(i) ∠COE

(j) ∠DOE
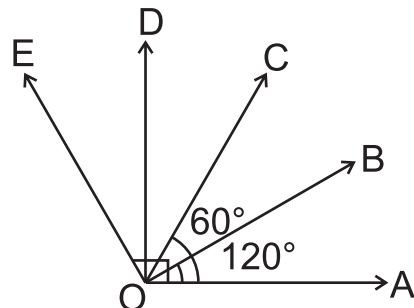
11. Find the measurement of each angle of a rectangle and a square.

12. Write True or False :

(a) A line has only one end point.   _____

(b) is the line segment $\overline{PQ}$.   _____

(c) A plane has no boundary.   _____

(d) A plane has two properties.   _____

(e) A line segment can be drawn on the paper.   _____

(f) A ray has an indefinite length.   _____

13. Write the definition of each of the following :

(a) Line segment   (b) Line   (c) Point   (d) Plane

14. Draw the following angles with the help of a protractor :

(a) ∠ABC = 55°   (b) ∠XYZ = 125°

Types Of Angles

1. Right Angle : An angle whose measure is 90° is called a right angle.

In the figure, ∠ABC = 90°. It is a right angle.

Example : Corners of walls, Note book, Almirah.
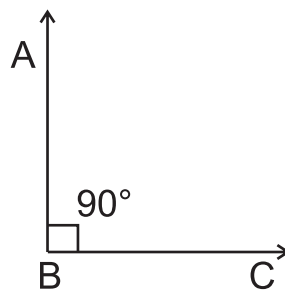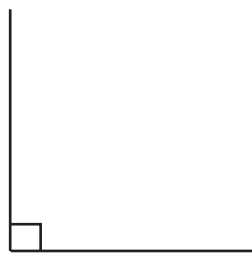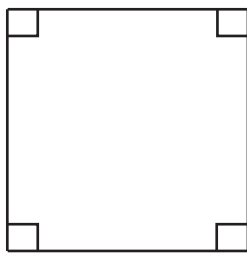
Corners of walls   Note Book   Almirah
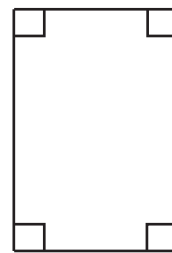
2. Acute Angle : An angle whose measure is more than 0° but less than 90° is called an acute angle.

50°
Q   R

80°
B   C
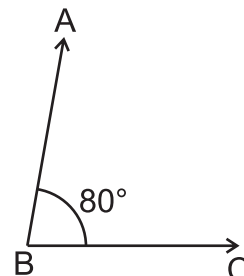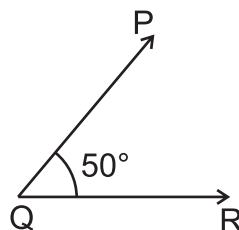
3. Obtuse Angle : An angle whose measure is greater than 90° but less than 180° is called an obtuse angle. In the figures, ∠KLM = 130° > 90°, so it is an obtuse angle and ∠XYZ = 160° > 90°, so it is also an obtuse angle.

K

130°
L   M

(a)

X
160°
Y   Z

(b)
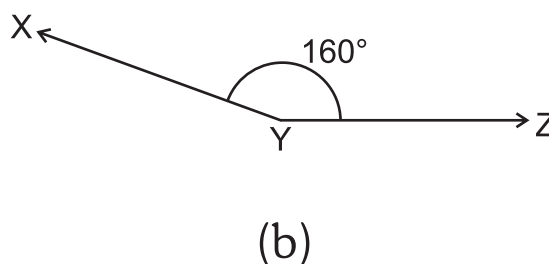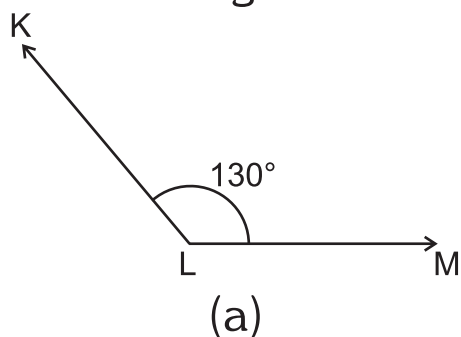
4. Straight Angle : An angle whose measure is 180° is called a straight angle.

∠ABC = 180°, so it is a straight angle.

180°
A   B   C
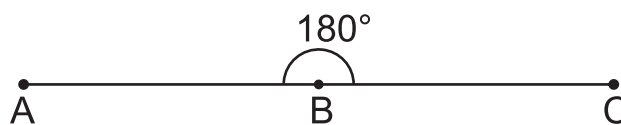
Angles Through Paper Folding

1. Take a sheet of paper and fold it in half.

2. Unfold it, you will get two 90° angles or two right angles.

90°   90°

Right angle
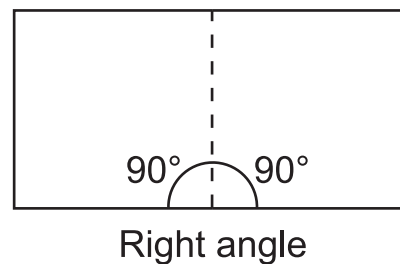
3. Again fold one 90° angle in a triangular shape and then unfold it, you will get two 45° angles which are acute angles.

90°

90° 45° 45°
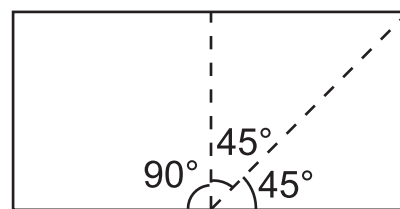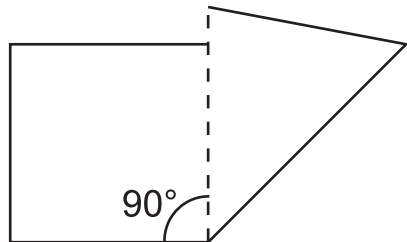
Acute angles

5. Reflex Angle : An angle whose measure in between 180° to 360° is known as reflex angle.
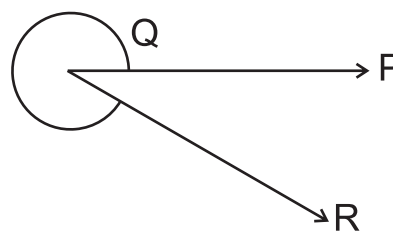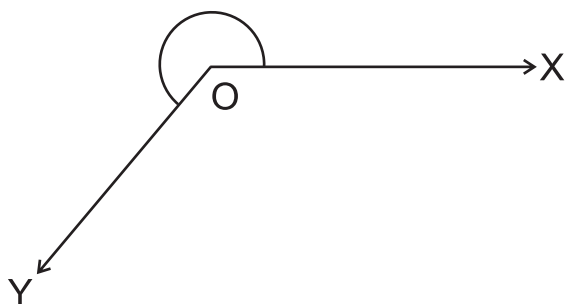
6. Complete Angle : Angles which exactly measures 360° are known as complete angle and written as $\angle AOA' = 360°$.
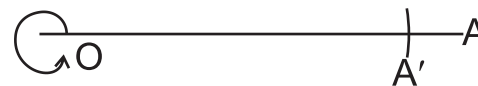
Drawing And Tracing Angle

Drawing An Angle Using A Protractor :

Example : Draw $\angle AOB = 45°$.
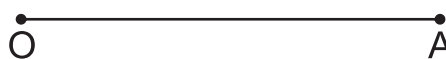
1. Draw a ray OA.

2. Place the centre of the protractor on O and adjust it such that the base line conicides with $\overrightarrow{OA}$.

3. Since OA points to 0° on the inner scale, mark B at 45° on the inner scale.

4. Remove the protractor and draw $\overrightarrow{OB}$.

45°
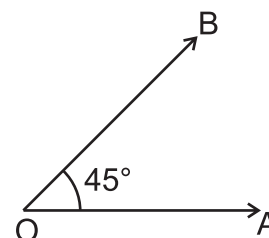
$\angle AOB = 45°$ is the required angle.

Tracing An Angle :

Example : Trace a given $\angle AOB$ of measure 30°.

1. Place tracing paper an $\angle AOB$.
2. Mark the points A, O and B on the tracing paper.
3. Now place the tracing paper on another sheet of paper. Press the points on the tracing paper on another paper.

4. Join these points through, say QP and QR as shown. $\angle PQR$ is the required angle which is equal to $\angle AOB$.
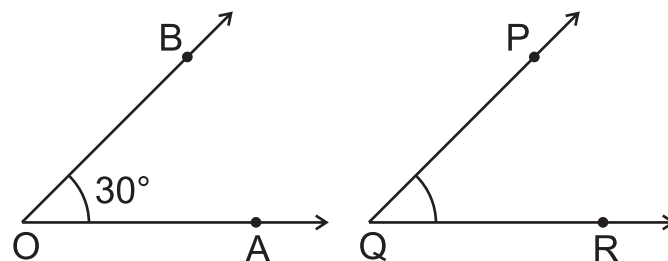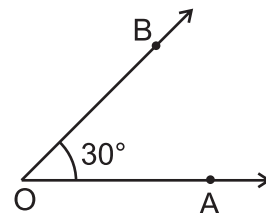
Exercise - 9(B)

1. Name the angles formed in each of the figure :

(a)

(b)

(c)
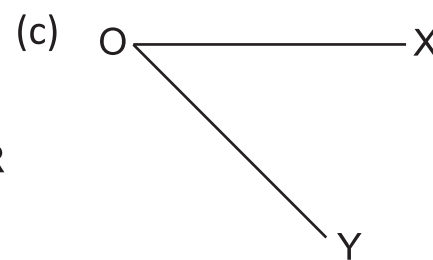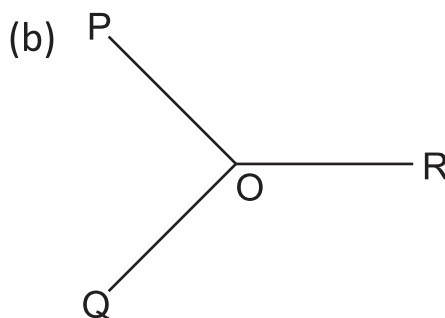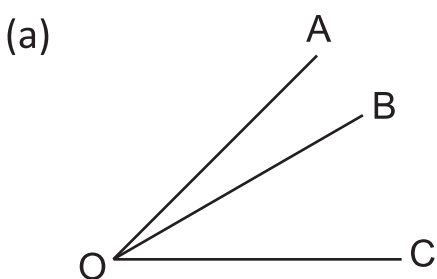
2. Measure and identify the angle *i.e.* acute, obtuse or right angle :

(a) (b) (c) (d)
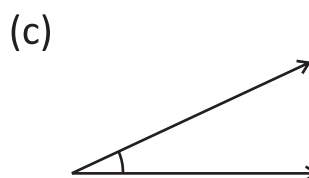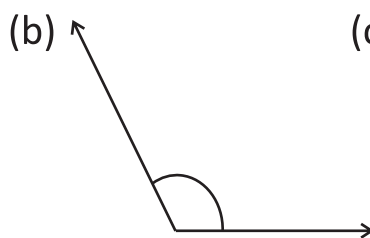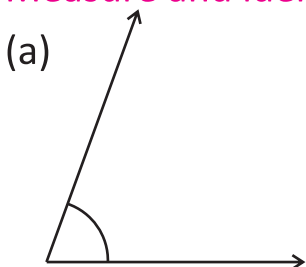
3. Construct the following angles using protractor :

(a) 40° (b) 75° (c) 105° (d) 15°

(e) 140° (f) 180° (g) 70° (h) 55°

4. Draw the hands of the clocks to show time when they make following angles. Also write the time.

(a) Right Angle

(b) Acute Angle
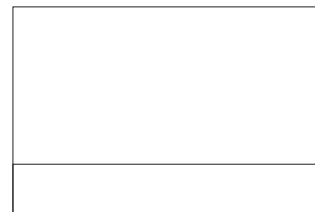
(c) Obtuse Angle
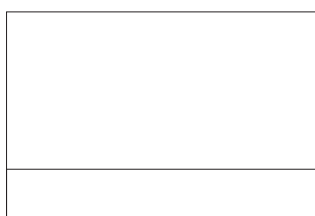
(d) Straight Angle
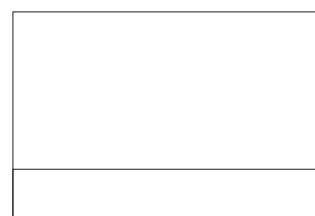
5. How many degrees are there in :

(a) $\frac{1}{2}$ a right angle.

(b) $\frac{1}{3}$ of right angle.

(c) 2 times of right angle.

(d) 4 times of right angle.

6. Fill in the blanks :

(a) The measure of a _____ angle is 90°.

(b) The measure of a _____ angle is 180°.

(c) Angles are measured in _____.

(d) The two points where the two rays meet to form an angle is called _____.

(e) The measure of an _____ angle is between 0° and 90°.

7. Identify the angles :
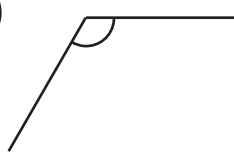
(a) (b) (c) (d)

Construction Of Lines

Set Square : Open your Geometry box. You will find two pieces similar to the figures given below, they are called set squares. Set squares are used to construct perpendicular and parallel lines.
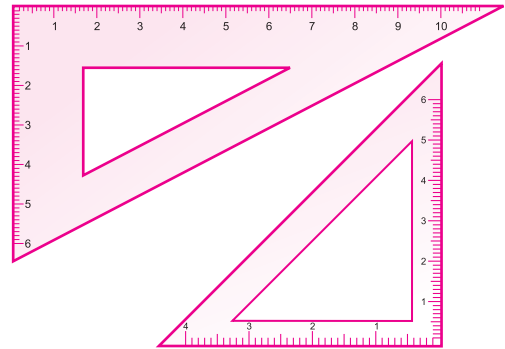
Parallel Lines : Parallel lines are the lines which lie in the same plane and never meet each other even if extended to any length on both sides. They always remain at equal distance from each other.
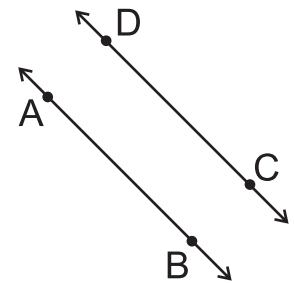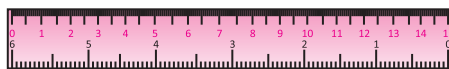
The symbol for parallel lines is ||. In this figure, line AB is parallel to line CD. So, we write them as $\overleftrightarrow{AB} || \overleftrightarrow{CD}$.

A railway track, a ruler, blackboard are examples of parallel lines.

Railway track

Ruler

Blackboard

Intersecting Lines : You must have seen latitudinal and longitudinal lines which cross each other on the globe.

Intersecting lines are the lines which cross each
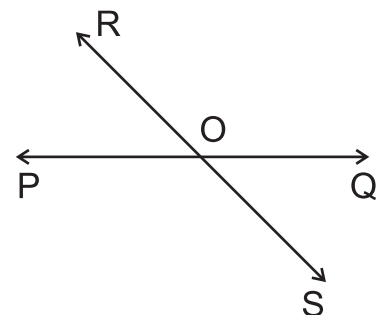
other. The point at which they cross is called the point of intersection.

In this figure, lines PQ and RS intersect each other at point O. So PQ and RS are intersecting lines and O is the point of intersection.
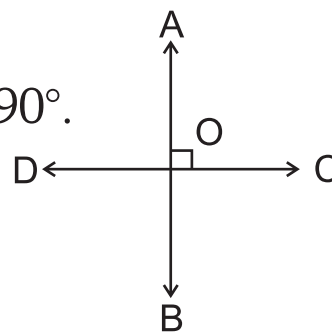
Perpendicular Lines : Perpendicular lines are the lines which intersect each other at right angle.

The symbol for perpendicular line is ⊥.

In the figure, ∠AOC = ∠BOC = ∠AOD = ∠BOD = 90°.

Line AB is perpendicular to line CD.

we can write AB ⊥ CD.

Triangles

A closed plane figure made up of three line segments is called a triangle. In the figure, ABC is a triangle.
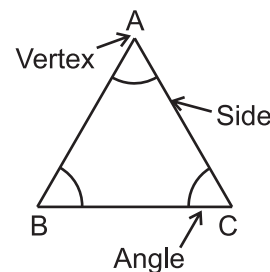
A, B and C are 3 vertices. AB, BC and CA are 3 sides. ∠ABC, ∠BCA and ∠CAB are its three angles.

The triangle is denoted by the symbol Δ. Thus, triangle ABC is written as ΔABC.

The sum of the angles of a triangle is always equal to 180°.
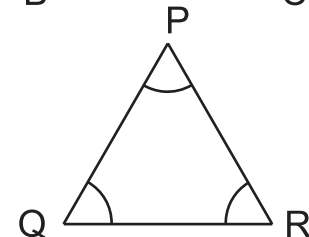
In Δ ABC, ∠A + ∠B + ∠C = 180°.

Types Of Triangle According To Angle :

There are three types of triangles with respect to their angles;

Right-angled Triangle : A triangle in which one of the angles is 90°, is called a right angled triangle. In $\triangle ABC$, $\angle B = 90°$, so it is right-angled triangle.
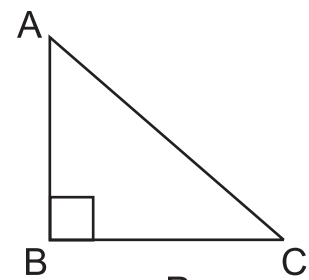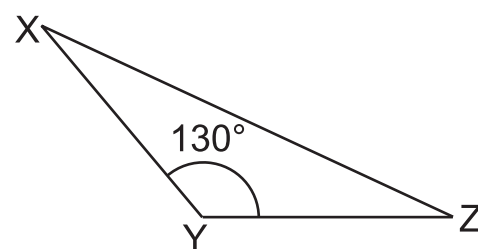
Acute-angled Triangle : A triangle in which all the angles are less than 90°, is called an acute angled triangle.

In $\angle PQR$, $\angle P$, $\angle Q$ and $\angle R$ are all acute angles. So, $\angle PQR$ is an acute-angled triangle.

Obtuse-angled Triangle : A triangle in which one of the angle is greater than 90°, is called an obtuse-angled triangle.

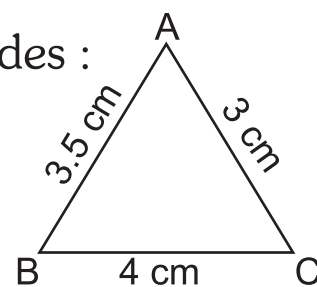In $\triangle XYZ$, $\angle Y$ is 130°. So, it is an obtuse-angled triangle.

Types Of Triangle According To Sides :

There are three types of triangles with respect to their sides :

Scalene Triangle : A triangle in which all the three sides are of different lengths, is called scalene triangle.
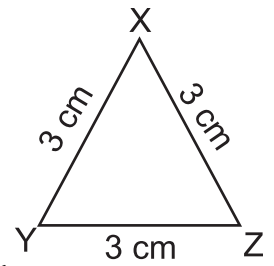
$\triangle ABC$ is a scalere triangle, since AB, BC and CA all have different lengths.

Isosceles Triangle : A triangle in which only two sides are of equal length, is called an isosceles triangle.
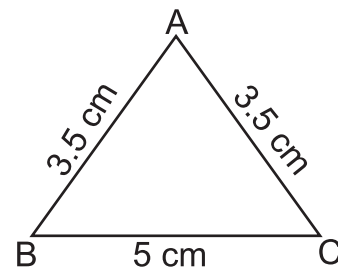
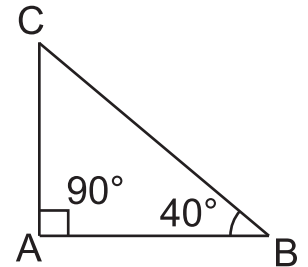In $\triangle ABC$, AB = AC, so, $\triangle ABC$ is an isosceles triangle.

Equilateral Triangle : A triangle in which all sides are of equal length is called an equilateral triangle.

In $\triangle XYZ$, $XY = YZ = ZX$, so $\triangle XYZ$ is an equilateral triangle.

Example : In $\triangle ABC$, $\angle A = 90°$ and $\angle B = 40°$, find $\angle C$.

Solution : We know that, $\angle A + \angle B + \angle C = 180°$.

$\angle A + \angle B = 90° + 40° = 130°$

$\therefore \angle C = 180° - 130° = 50°$.

Exercise - 9(C)

1. Tick (✓) on the pair of parallel lines :

(a)　　　　　(b)　　　　　(c)　　　　　(d)
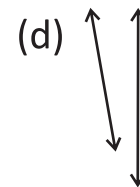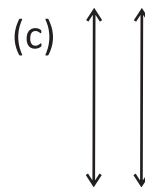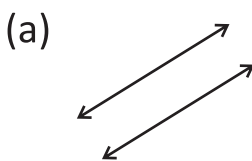
2. Tick (✓) on the pair of intersecting line :

(a)　　　　　(b)　　　　　(c)　　　　　(d)
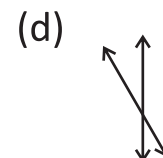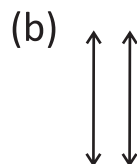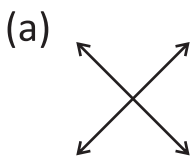
3. Tick (✓) on perpendicular lines :

(a)　　　　　(b)　　　　　(c)　　　　　(d)
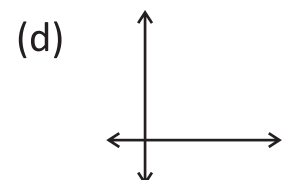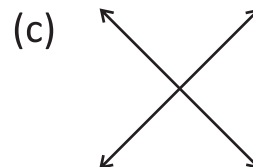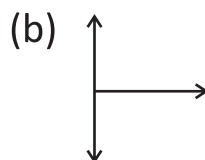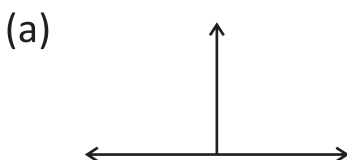
4. Name the types of triangles :

(a)

(b)

(c)
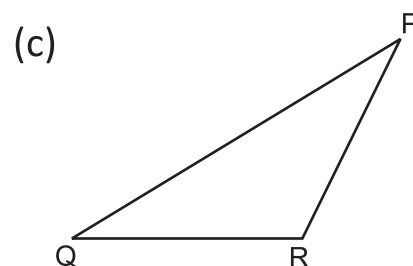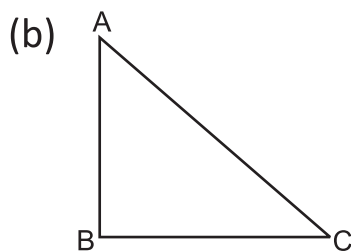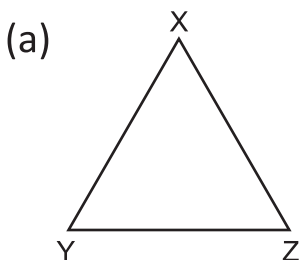
5. Classify the triangles according to their angles :

(a)

(b)

(c)
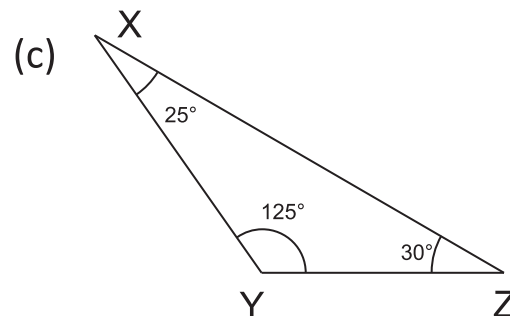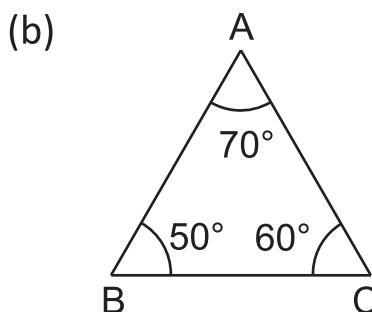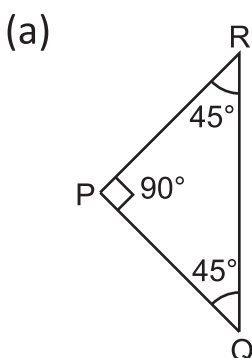
6. Classify the triangles according to their sides :

(a)

(b)

(c)
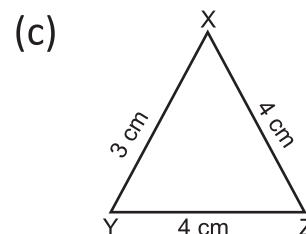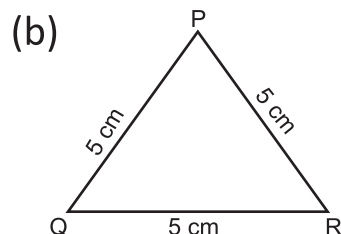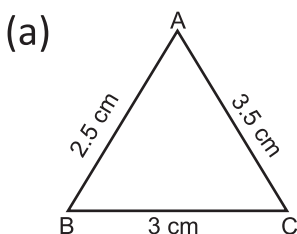
7. Find the third angle when two angles of a triangle are given :

(a) 90°, 25°   (b) 75°, 50°   (c) 105°, 45°   (d) 45°, 35°

8. How many right angles can a triangle have?

9. Construct a triangle having sides 4 cm, 5 cm and 6 cm.

10. Construct an equilateral triangle of side 6 cm each. Measure its angles. Are all these angles equal?

11. Construct a triangle XYZ, in which XY = 6 cm, YZ = 5 cm and ∠Y = 65°.

12. Construct a triangle PQR, in which QR = 6 cm. ∠Q = 45°, ∠R = 70°.

13. Construct a △ABC, in which BC = 6 cm, AB = AC = 7 cm.

14. Fill in the blanks :

(a) A triangle which has one _____ angle is called an obtuse-angled triangle.

(b) In an equilateral triangle, all angles are of equal _____.

(c) In an _____ triangle, the opposite sides are equal.

(d) A triangle with all its sides unequal is called a _____ triangle.

15. True or False :

(a) Two parallel lines are always at same distance apart. _____

(b) Two intersecting lines never cut each other. _____

(c) The symbol of parallel lines is ⊥. _____

(d) The symbol of perpendicular lines is ⊥. _____

(e) Two lines in a plane are either intersecting or parallel. _____

Circle

We have already studied about a circle in the previous class.

All points on a circle are at equal distance from a fixed point. The fixed point is called the centre of the circle. In this figure, O is the centre of the circle.
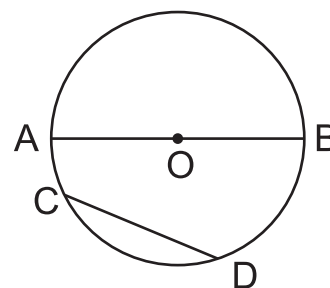
The distance from any point on the circle to the centre is called radius. OA and OB are the radii of the circle.

A line segment that passes through the centre of the circle, connecting two points on the circle is called diameter. AB is the diameter of the circle.

The length of the diameter is twice the length of the radius.

<center>Diameter = 2 × radius</center>

A line segment within a circle that touches two points on the circle is called a chord.

CD is the chord of the circle.

To draw a circle :

Example : Draw a circle O of radius 3 cm.

1. Fix a pencil in the compass.
2. Open the compass and fix the distance between the points with the help of scale at 3 cm.
3. Mark a point O on a paper.
4. Hold the tip of compass at 0 and rotate the pencil point to draw a circle of radius 3 cm.

<center>148</center>
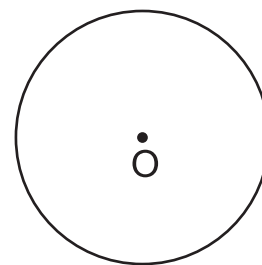
Circumference

Circumference is the length of a circle. It is a curved line. So it cannot be measured with a ruler.
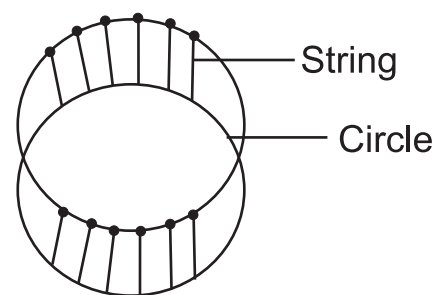
Relation Between Diameter And Circumference :

Circumference = 3 × diameter

Example : Find the approximate circumferences of two circles whose.

(i) radius is 2 cm, and   (ii) diameter is 10 cm.

(i) Circumference = 3 × diameter
= 3 × 10 cm = 30 cm

(ii)   Diameter = 2 × radius
= 2 × 2 = 4 cm

Circumference = 3 × diameter
= 3 × 4 = 12 cm

Quadrilateral

A quardrilateral is a four-sided figure.

Types Of Quadrilateral

Rectangle : A quadrilateral with opposite sides equal and parallel and every angle measuring 90°, is called a rectangle.

Square : A quadrilateral with all four sides equal, opposite sides parallel and each angle measuring 90°, is called a square.
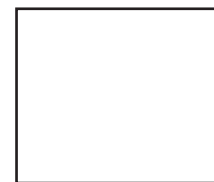
Parallelogram : A quadrilateral with opposite sides equal, parallel and opposite angles equal, is called a parallelogram.
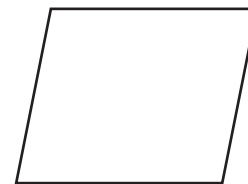
Rhombus : A quadrilateral with all sides equal, opposite sides parallel and opposite angles equal, is called a rhombus.
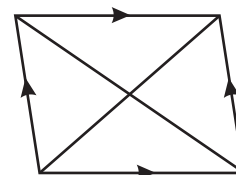
Trapezium : A quadrilateral with one pair of opposite sides parallel, is called trapezium.
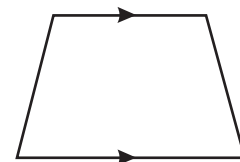
Isosceles Trapezium : A quadrilateral with one pair of opposite sides parallel and the other pair of opposite sides equal, and angles opposite to equal sides equal, is called isosceles trapezium.
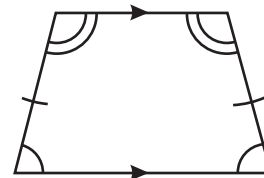
By joining the diagonal vertices of a quadrilateral, we can divide the quadrilateral into two triangles. We know that the sum of the angles of a triangle is 180°.

Hence, the sum of all four angles of a quadrilateral is $2 \times 180° = 360°$.
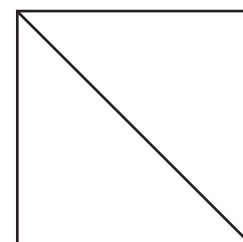
TRICKY CHALLENGE

1. Take 3 five rupee coins and measure the circumference of one coin with a string.
2. What is the circumference of one coin? Is it equal to the diameter of the 3 coins?

Exercise - 9(D)

1. Draw circles of the given radii. Also find the diameter of each circle :
   (a) 4 cm   (b) 5.5 cm   (c) 2.6 cm   (d) 7 cm

2. Draw a circle O of diameter 5 cm. Measure the length of its radius.

3. Find the circumferences of the circles with the following measurements :
   (a) diameter = 8 cm   (b) diameter = 35 mm
   (c) diameter = 4.2 cm   (d) radius = 7.5 cm
   (e) radius = 62.8 mm   (f) radius = 5 cm

4. Find the diameters of the circles with the following circumferences :
   (a) 27 cm   (b) 138 mm   (c) 32.4 cm   (d) 120 mm

5. Find the radii of the circles with the following circumferences :

Mathematics 3rd

(a) 36 cm   (b) 52.8 cm   (c) 124 mm

6. Draw a circle with centre P and diameter 6 cm. Draw another circle with the same centre and radius 2 cm. Do these circles intersect each other?

7. Fill in the blanks :

(a) A circle has _____ sides or corners.

(b) Diameter is the _____ chord of the circle.

(c) The distance of a point on the circle from the centre is called its _____.

(d) The circumference of a circle is approximately equal to _____ times its diameter.

8. Name the following four sided figures :

1.   2.   3.   4.
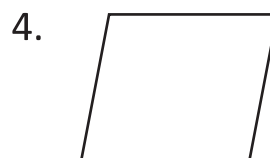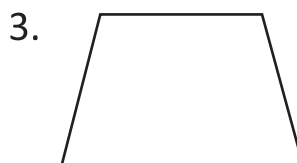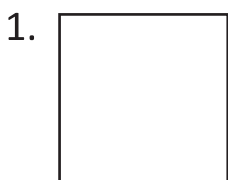
9. Draw a square of side 4.5 cm using ruler and protractor only.

10. Draw a rectangle with l = 5.5 cm, b = 4.2 cm. Using ruler and protractor only.

Review Of The Chapter

1. Draw 85° and 135° angles using a protractor.

2. Find the third angle of the triangle whose two angles are 125° and 15°.

3. Draw a circle P with radius 4 cm. Now draw another circle with radius 3 cm in such a way that circles intersect each other at two points.

4. Draw a square of side 4 cm using ruler and protractor only.

5. Draw a rectangle with l = 4.5 cm and b = 3.5 cm using ruler and protractor only.

6. Construct a triangle ABC, in which AB = 5 cm $\angle A = 50°$, $\angle B = 70°$.

7. Construct a triangle, in which AB = 4 cm, BC = 4.5 cm, CA = 3.5 cm.

8. Find the third angle when two angles are given as below :

(a) 90°, 45°   (b) 40°, 70°   (c) 110°, 30°   (d) 40°, 110°

9. Construct the following angles :

(a) 35°   (b) 65°   (c) 95°   (d) 110°

10. Represent the following :

(a) Point P   (b) Plane X   (c) AB   (d) PQ

11. Name the following figures :

(a)

(b)
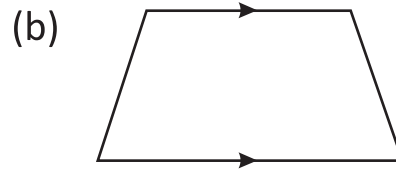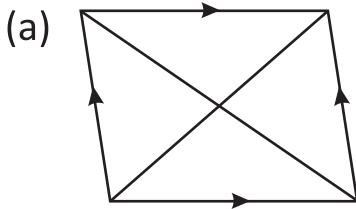
12. Complete the following table :

	Circumference (Cm)	Diameter (cm)	Radius (cm)
(a)	2.4		
(b)		7.2	
(c)			3
(d)	5.4		
(e)			9.9

13. Find the diameters of the circles with the following circumferences :

(a) 27 cm   (b) 32.4 cm   (c) 18 cm   (d) 24 cm

14. Fill in the blanks :

(a) A flat surface extended on all sides represents a _____.

(b) A line segment has _____ end points.

(c) The distance between _____ lines always remains the same.

(d) An angle is formed by two _____ having a common end point.

(e) A scalene triangle have all side of _____ length.

(f) The measure of an obtuse angle is between _____ and _____.

15. Measure the angles in the following figure and classify them as acute, obtuse or right angles.

(a) ∠AOQ   (b) ∠AOS

(c) ∠AOT   (d) ∠AOB

(e) ∠POT   (f) ∠POS

(g) ∠QOB   (h) ∠QOR
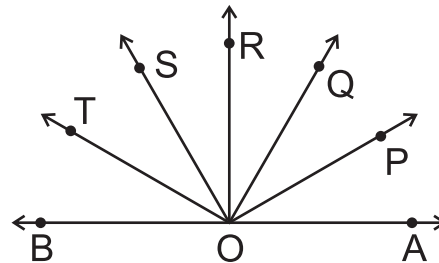
16. The circumference of a circle is 36 cm. Find its diameter and radius.

17. In △ABC, ∠A = 75° and ∠B = 35°, find ∠C.

MULTIPLE CHOICE QUESTIONS (MCQs)

1. The straight path between two points, is called a :

   (a) Line ☐ (b) Line segment ☐ (c) Ray ☐

2. An angle whose measure is 180°, is called :

   (a) Acute angle ☐ (b) Obtuse angle ☐ (c) Straight angle ☐

3. An angle whose measure is more than 0° but less than 90° is called an :

   (a) Acute angle ☐ (b) Obtuse angle ☐ (c) Straight angle ☐

4. A quadrilateral with one pair of opposite side parallel, is called :

   (a) Trapezium ☐ (b) Rhombus ☐ (c) Parallelogram ☐

5. A triangle in which only two sides are of equal length is called an :

   (a) Scalene triangle ☐ (b) Isosceles triangle ☐ (c) Equilateral triangle ☐

6. A triangle in which all three sides are of different length is called :

   (a) Scalene triangle ☐ (b) Isosceles triangle ☐ (c) Equilateral triangle ☐

7. 1/4 of right angle is equal to :

   (a) 15° ☐ (b) 45° ☐ (c) None of these ☐

8. An angle whose measure is 90° is called a :

   (a) Acute angle ☐ (b) Right angle ☐ (c) Obtuse angle ☐

9. A line extends in :

   (a) One direction ☐ (b) Two directions ☐ (c) Three directions ☐

10. A ray extends in :

    (a) One direction ☐ (b) Two directions ☐ (c) Three directions ☐

Time

In earlier class, we have studied about time in details. Here in this chapter, we will discuss more facts about time.

Time

We will learn to read the measure of precise time *i.e.,* second. Second is a very short period of time. Just as 60 minutes make an hour, 60 seconds make a minute.

Minute hand
Second hand
Hour hand
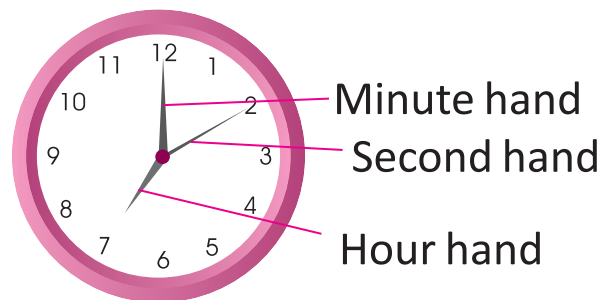
1 minute = 60 seconds

Most of the clocks have three hands. Out of these, we are familiar with two hands, the short hand or the hour hand and the long hand or the minute hand. Besides these, there is another thinner hand which is called second hand as it shows the seconds.

On the dial of the clock, the small marks which show the minutes, show the seconds too.

Now let us look at some of the clocks, and try to read the time.
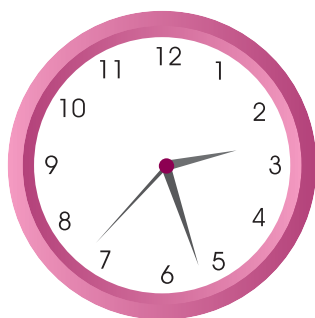
Hour hand is after 2,
Minute hand is at 26,
Second hand is at 37,
Thus, the time is 2 : 26 : 37.
Hour hand is after 4,
Minute hand is at 55,
Second hand is at 35,
Thus, the time is 4 : 55 : 35,

KEEP IN MIND

In short, we denote hours at 'hrs', minute as 'min' and second as 'sec'.

Mathematics 3rd
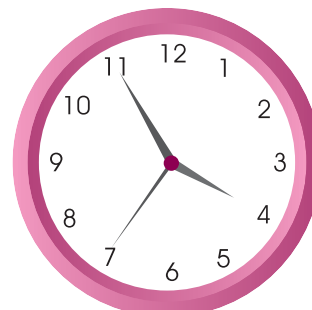
Relationship And Conversion (Hours, Minutes And Seconds)

Seconds and Minutes

60 seconds = 1 minute

To convert 'minutes' into 'seconds', multiply minutes by 60.

To convert 'seconds' into 'minutes', divide seconds by 60.

Example 1 : Convert into seconds :

　　　　　(a) 7 minutes　　　　　　　　(b) 4 minutes 9 seconds

Solution : (a) 7 minutes

　　　　　　　1 min = 60 sec

　　　　　　　7 min = 7 × 60 sec = 420 seconds

　　　　　(b) 4 minutes 9 seconds

　　　　　　　1 min = 60 sec

　　　　　　　4 min = 4 × 60 sec = 240 seconds

　　　　　　　240 sec + 9 sec = 249 seconds

Example 2 : Convert into minutes :

　　　　　(a) 360 seconds　　　　　　　(b) 425 seconds

Solution : (a) 360 seconds

　　　　　　　1 sec = 1/60 min = (1 ÷ 60) min

　　　　　　　Thus, 360 sec = (360 ÷ 60) min = 6 minutes

　　　　　(b) 425 seconds

　　　　　　　Thus, 425 sec = (425 ÷ 60) min = 7 minutes 5 seconds

Minutes and Hours

60 minutes = 1 hour

To convert hours into minutes, multiply hours by 60.

To convert minutes into hours, divide minutes by 60.

Example 1 : Convert into minutes :

　　　　　(a) 24 hours　　　　　　　　(b) 2 hours 13 minutes

Solution : (a) 24 hours

　　　　　　　= 24 × 60 min = 1440 minutes

(b) 2 hours 13 minutes

= 2 hours + 13 minutes = (2 × 60 + 13) minutes

= (120 + 13) minutes = 133 minutes

Example 2 : Convert into hours :

(a) 1260 minutes   (b) 240 minutes

Solution   : (a) 1260 minutes

= 1260 ÷ 60 hours = 21 hours

(b) 240 minutes

= 240 ÷ 60 hours = 4 hours

Conversion Of Seconds To Hours, Minutes And Seconds

Example   : Convert 5386 seconds into hours, minutes and seconds.

Solution   : First we convert the given sec to the minutes.

5386 sec = (5386 ÷ 60) min = 89 min 46 sec

Now, we convert 89 min to hrs and min.

89 min = (89 ÷ 60) hours = 1 hour 29 min.

Therefore, 5386 sec = 1 hour 29 min 46 sec.

Regrouping

While solving the addition and subtraction sums on the measure of time, we have to regroup some measures.

Example 1 : Regroup the following :

(a) 68 sec   (b) 5 min 80 sec

Solution   : (a) 68 sec = 60 sec + 8 sec   = 1 min + 8 sec

= 1 min 8 sec

(b) 5 min 80 sec = 5 min + 60 sec + 20 sec

= 5 min + 1 min + 20 sec = 6 min 20 sec

Relationship And Conversion (Years, Months And Days)

Days and Months

1 week = 7 days, 　　　　　　　　30 days = 1 month

To convert months into days, multiply month by 30.

To convert days into month, divide days by 30.

Example 2 : Convert into days :

　　　　　　(a) 8 months 　　　　　　　　(b) 5 months 24 days

Solution 　: (a) 8 months

　　　　　　　　= 8 × 30 days = 240 days

　　　　　　(b) 5 months 24 days

　　　　　　　　= 5 × 30 days + 24 days = 150 days + 24 days

　　　　　　　　= 174 days

Example 3 : Convert into months :

　　　　　　(a) 540 days 　　　　　　　　(b) 626 days

Solution 　: (a) 540 days

　　　　　　　　= 540 ÷ 30 months = 18 months

　　　　　　(b) 626 days

　　　　　　　　= 626 ÷ 30 months = 20 months 26 days

Months and Years

12 months = 1 year

To convert years into months, multiply years by 12.

To convert months into years, divide months by 12.

Example 4 : Convert into months :

　　　　　　(a) 14 years 　　　　　　　　(b) 2 years 5 months

Solution 　: (a) 14 years

　　　　　　　　= 14 months × 12 months = 168 months

　　　　　　(b) 2 years 5 months

　　　　　　　　= 2 × 12 + 5 months = 24 months + 5 months

　　　　　　　　= 29 months

Example 5 : Convert into years :

      (a) 480 months   (b) 168 months

Solution   : (a) 480 months

                = 480 ÷ 12 years = 40 years

          (b) 168 months

                = 168 ÷ 12 years = 14 years

Days and Years

365 days = 1 year

To convert years into days, multiply years by 365.

To convert days into years, divide days by 365.

Example 6 : Convert into days :

      (a) 5 years   (b) 2 years 145 days

Solution   : (a) 5 years

                = 5 × 365 days = 1825 days

          (b) 2 years 145 days

                = 2 × 365 days + 145 days

                = 730 + 145 days = 875 days

Example 7 : Convert into years :

      (a) 730 days   (b) 1325 days

Solution   : (a) 730 days

                = 730 ÷ 365 = 2 years

          (b) 1325 days

                = 1325 ÷ 365 = 3 years 135 days.

Exercise - 10(A)

1. Convert :

   (a) 12 min 28 sec into sec   (b) 15 hours into min

   (c) 927 sec into min   (d) 480 min into hours

2. Convert :

   (a) 3 months 17 days into days   (b) 1 year 225 days into days

   (c) 7 years 4 months into months   (d) 840 days into months

3. Convert the following :
   (a) 6 min = _____ sec
   (b) 180 sec = _____ min
   (c) 6 hour = _____ min
   (d) 300 min = _____ hour
4. Convert the following into sec :
   (a) 3 min 30 sec
   (b) 5 min 25 sec
   (c) 15 min 15 sec
   (d) 10 min 20 sec
5. Convert the following into min :
   (a) 515 sec
   (b) 479 sec
   (c) 5 hours 15 min
   (d) 14 hours 39 min
6. Convert the following into hours :
   (a) 325 min
   (b) 712 min
   (c) 247 min
   (d) 835 min
7. Convert the following to hours, min and sec :
   (a) 5849 sec
   (b) 3965 sec
   (c) 8912 sec
   (d) 6385 sec
8. Sheena spends 3 hours 25 min in a gym daily. Raj spends 180 min daily. Who spends more time?
9. Convert :
   (a) 5 years to months
   (b) 74 months to years
   (c) 89 months to years
   (d) 7 years 9 months to months
10. A train completes a journey in 8 hours 16 min 35 sec and second train completes the same journey in 36.125 sec. Which train takes less time?
11. Change into hours and min :
   (a) 840 min
   (b) 208 min
   (c) 710 min
   (d) 140 min
12. Change into min and sec :
   (a) 950 sec
   (b) 1008 sec
   (c) 970 sec
   (d) 490 sec
13. Convert 15000 sec into hours, min and sec.

Addition And Subtraction Of Time

Addition of Time

Example : Add 30 min 42 sec and 25 min 45 sec.

Solution :

min	sec
30	42
+ 25	45
55	87

Thus, the sum is 55 min 87 sec.
87 sec = 60 sec + 27 sec

So, 55 min 87 sec = 55 min + 60 sec + 27 sec = 56 min 27 sec.

Subtraction of Time

Example 1 : Subtract 13 min 28 sec from 32 min 12 sec.

Solution :

min	sec
31	72
−13	28
18	44

32 min 12 sec = 31 min 72 sec.
(Borrow 1 min to 12 sec, i.e.
1 min + 12 sec
= 60 sec + 12 sec = 72 sec)

Thus, the difference is 18 min 44 sec.

Example 2 : Subtract 2 hours 53 min 48 sec from 5 hours 34 min 29 sec.

Solution :

hour	min	sec
5	34	29
−2	53	48

hour	min	sec
4	93	89
−2	53	48
2	40	41

Thus, the difference is 2 hours 40 min 41 sec.

24 Hour Clock

We have read about the 12 hour clock in our previous class. In a 12 hour clock, a day is divided into two parts. For any time which lies between 12 midnight to 12 noon, we use 'am'. For times between 12 noon to 12 midnight, we use 'pm'.

Example : 6:30 (evening) = 6:30 pm
11:30 (morning) = 11:30 am

KEEP IN MIND

We do not use colon (:) to separate hours and min in the 24 hour clock.

Example : Rewrite the following time using 24 hour clock time.
(a) 8:42 pm   (b) 11:30 am

Solution : (a) 8:42 pm = (0842 + 1200) hours = 2042 hours.
(b) 11:30 am = 1130 hours.

Time Duration

It is very convenient to find the time duration of an activity using a 24 hour clock.

Example 1 : A cricket match started at 0830 hours and finished at

1630 hours. What was the duration of the match?

Solution : The starting time = 0830 hours

The finishing time = 1630 hours

Thus, the total duration (1630 – 0830) = 8 hours

Example 2 : A train leaves Jaipur at 9:15 am and reaches Lucknow at 3:40 pm. Find the time taken by the train to reach Lucknow.

Solution : 9:15 am to 12.00 noon = 2 hours 45 min

12:00 noon to 3:40 pm = 3 hours 40 min

Thus, the time taken by the train to reach Lucknow from Jaipur is 6 hours 25 min.

hour	min
2	45
+ 3	40
5	85

Example 3 : Riya gave a suit piece for stiching to a tailor on 24th March and he stitched the suit in 20 days. Find out the date on which he finished stitching the suit.

Solution : Number of days from 24th march to 31st March

= 31 – 24 + 1 = 8 days

Number of days in April = 20 – 8 = 12 days

Thus, the tailor finished the stitching on 12th April.

Exercise - 10(B)

1. Add :
   (a) 35 min 26 sec and 42 min 52 sec.
   (b) 12 years 6 months and 3 years 9 months.
   (c) 9 years 11 months and 4 years 9 months.
   (d) 12 hours 54 min and 7 hours 43 min.
2. Subtract :
   (a) 42 min 38 sec from 50 min 17 sec.
   (b) 17 years 8 months from 29 years 3 months.
   (c) 13 hours 28 min from 16 hours 12 min.
   (d) 20 min 57 sec from 27 min 35 sec.
3. Nisha joined dance classes for 8 years 6 months. Then she joined computer

classes for 3 years 6 months. Find the total duration of both the classes.

4. Train A take 5 hours 25 min to reach Jaipur from Delhi, and train B takes 9 hours 25 min to reach Jaipur from Delhi. Find by how much more time train B takes then train A to reach Jaipur.

5. Find the time duration :
   (a) 8:10 am to 1:40 pm   (b) 8:45 am to 12:00 noon
   (c) 9:10 am to 4:50 pm   (d) 4:25 pm to 1:30 am

6. A school starts at 7:05 am and closes at 1:15 pm. Find out how long the school remains open.

7. A train leaves Hyderabad at 1415 hour on Friday and reaches Bangalore at 0730 hour on Saturday. Find the duration of the journey.

8. Sumit goes to bed at 9:30 pm and gets up at 7:00 o'clock in the morning. How long does he sleep?

9. Mohit applied for leave in the office on 12th Jan. He will join the office after 40 days. Find out the date on which he will join the office again.

10. Complete the following table :

	12 hour clock	24 hour clock
(a)	7 am	
(b)	10:15 am	
(c)		1200 hours
(d)		1555 hours

Starting Time And Finishing Time

To find the finishing time : When the starting time and the duration of an activity is given and we have to find out the finishing time, then we add the duration in the starting time.

Example   :   A car started at 8:30 am and after 6 hrs 15 min, it reached its destination. Find out its arrival time.

Solution   :   Given, the starting time = 8:30 am
                And, the time duration = 6 hours 15 min
                Now, finishing time = starting time + time duration
                = 8:30 am + 6 hours 15 min.
                To add these, we will count forward in parts.

$$8:30 \text{ am} \xrightarrow{6 \text{ hrs}} 2:30 \text{ pm} \xrightarrow{15 \text{ min}} 2:45 \text{ pm}$$

Therefore, the car arrived at 2:45 pm.

To find the starting time : To find the starting time of an *event* when its finishing time and its duration is given, we subtract the later from the former. And for this, we will count backwards.

Example   : An award function ended at 1:30 am. The duration of the function was 5 hours 30 min. At what time did the function start?

Solution : Finishing Time = 1:30 am
Time duration = 5 hrs 30 min
Now, starting time = finishing time – time duration
= 1:30 am – 5 hrs 30 min
To Subtract these, we will count backward in parts.

$$1:30 \text{ am} \xrightarrow{-1 \text{ hr}} 12:30 \text{ am} \xrightarrow{-4 \text{ hrs}} 8:30 \text{ pm} \xrightarrow{-30 \text{ min}} 8:00 \text{ pm}$$

Therefore, the function was started at 8:00 pm.

Calculating Days

Sometimes we may need to find out for how many days a certain event or an activity took place.

To find the finishing date :

Starting date + Duration = Finishing date.

To find the starting date :

Example : Rahul returned from his 45 days holiday on 10th July. When did his holiday begin?

Solution : Returned date = 10th July
Duration of holiday = 45 days
Starting date = ?
Count back 45 days from 10th July.
10th July to 1st July   = 10 days
30th June to 1st June = 30 days

31st May to 27th May = $\underline{\text{5 days}}$

$\underline{\text{45 days}}$

Thus, Rahul started his holiday on 27th May.

Exercise - 10(C)

1. Evaluate :

    (a) **Starting date =** 20 August

    Time duration = 35 days

    Finishing date = ?

    (b) **Duration =** 21 days

    Finishing date = 19 November

    Starting date = ?

2. Complete the following table :

	Starting date	Duration	Finishing date
(a)	21st Dec	24 days	
(b)	14th Nov	26 days	
(c)	8 March	47 days	
(d)		15 days	April 2nd
(e)		28 days	Jan 10th
(f)		40 days	June 24th

3. Mohan joined the coaching classes 20 days later. If the date of starting of coaching class was 20th June. Find the joining date of Mohan.

4. One seminar started at 10:40 am and lasted at 4:45 hrs. At what time seminar finished?

5. Final examination date is announced as 13th May and preparation holidays are declared for 28 days. Find the date of commencement of preparation holidays.

Review Of The Chapter

1. Convert the following, as indicated in the questions below.

    (a) 790 min = _____ sec.

    (b) 13 min = _____ sec.

    (c) 840 sec = _____ min.

    (d) 990 sec = _____ min.

    (e) 2 hrs 60 min = _____ hrs.

    (f) 4 hrs + 15 min = _____ min.

2. A match started at 10:15 am but due to weather, it is delayed by 3 hrs 15 min. Now, at what time match will start?

3. Train was scheduled for 1:15 pm, but it is rescheduled for 3:50 pm. What is the difference of timing in rescheduling?

4. A television program had 11 min of advertising in it. How many seconds were there for advertisement ?

5. Final Exams are postponed for 42 days, which were to start from 14th March. Now, what is the new date for starting of examinations?

6. Football team practices for 2 hrs 30 min every day. If today they started practice at 3:40 pm, at what time practice will end?

7. Subtract 8 hrs 25 min 30 sec from 18 hrs 20 min 15 sec.

8. Add 36 min 26 sec to 42 min 30 sec.

9. Find the time :
   (a) 3 hours 20 min after 11:45 am   (b) 4 hours 50 min before 7:20 pm

10. Find the date :
    (a) 13 days after 28 August   (b) 25 days before 16th Nov

11. A machine takes 3 seconds to fix the cap on a bottle of sauce. It has worked for 15 min. How many caps has it fixed?

MULTIPLE CHOICE QUESTIONS (MCQs)

1. 1 minute = _____ seconds.
   (a) 30 ☐   (b) 60 ☐   (c) 90 ☐

2. 1 hour = _____ seconds.
   (a) 60 ☐   (b) 120 ☐   (c) 3600 ☐

3. 3 minutes 4 seconds = _____ seconds.
   (a) 180 ☐   (b) 184 ☐   (c) 294 ☐

4. 1 hour = _____ minutes.
   (a) 60 ☐   (b) 120 ☐   (c) 3600 ☐

5. 69 sec = _____.
   (a) 1 min 9 sec ☐   (b) 6 min 9 sec ☐   (c) None of these ☐

6. 1 month = _____ days.
   (a) 12 ☐   (b) 30 ☐   (c) 60 ☐

Test Sheet-I

[Based On Chapter 1 to 2]

1. Tick (✓) the correct option :

    (a) There are _____ zeroes in ten lakhs.

    (i) 5 ☐   (ii) 6 ☐   (iii) 7 ☐

    (b) The number name of 1,00,00,0009.

    (i) One nine ☐   (ii) One lakh nine ☐   (iii) One crore nine ☐

    (c) The smallest 7-digit number is :

    (i) 99,99,999 ☐   (ii) 10,00,000 ☐   (iii) None of these ☐

    (d) One hundred thousand has :

    (i) 4 zeroes ☐   (ii) 5 zeroes ☐   (iii) 6 zeroes ☐

    (e) The greatest number is :

    (i) 9,99,99,999 ☐   (ii) 1,00,00,000 ☐   (iii) None of these ☐

2. Write the following numbers in figures :

    (a) Fifty lakh seventy nine thousand eight hundred twenty two.

    (b) Seven crore thirty two lakh eleven thousand two hundred nineteen.

    (c) Fourteen million five hundred forty thousand six hundred thirty.

3. Rewrite the following numerals with proper commas, using Indian place-value chart :

    (a) 32156329   (b) 183260   (c) 41325907

4. Write the successor and predecessor of each of the following :

    (a) 32,56,199   (b) 2,30,50,07   (c) 6,72,10,500

5. Arrange the following numerals in descending order :

    (a) 8,52,685; 38,56,138; 1,62,25,389; 2,34,65,225; 1,72,556

    (b) 8,00,006; 71,32,559; 10,27,308; 18,37,256; 2,72,56,139

6. (a) Write the greatest 4-digit number using digits 8, 9 and 3 repeating 3 two times.

    (b) Write the smallest 4-digit number using digits 7, 0 and 6 repeating 6 two times.

Test Sheet-II

[Based On Chapter 3 to 4]

1. Tick (✓) the correct option :

   (a) The number which is 10,000 more than 25,396 is :

   (i) 25,496 ☐   (ii) 26,396 ☐   (iii) 35,396 ☐

   (b) 9 lakhs = _____ ten-thousands.

   (i) 9 ☐   (ii) 90 ☐   (iii) 900 ☐

   (c) The result of subtraction is called the :

   (i) Minuend ☐   (ii) Subtrahend ☐   (iii) Difference ☐

   (d) 1 crore = _____ ten- lakhs.

   (i) 1 ☐   (ii) 10 ☐   (iii) 100 ☐

   (e) The number from which we subtract, is called the :

   (i) Minuend ☐   (ii) Subtrahend ☐   (iii) Difference ☐

2. Add :

   (a)
   $$
   \begin{array}{r}
   6\ 4\ 2\ 3\ 7\ 5\ 1\ 8 \\
   +\ 2\ 5\ 7\ 9\ 1\ 0\ 8\ 7 \\
   \hline
   \end{array}
   $$

   (b)
   $$
   \begin{array}{r}
   4\ 2\ 1\ 3\ 8\ 5\ 4 \\
   +\ 1\ 3\ 5\ 9\ 4\ 7\ 4 \\
   \hline
   \end{array}
   $$

   (c)
   $$
   \begin{array}{r}
   5\ 9\ 6\ 2\ 5\ 8\ 7\ 5 \\
   +\ 1\ 3\ 8\ 4\ 3\ 9\ 6\ 5 \\
   \hline
   \end{array}
   $$

3. Subtract :

   (a)
   $$
   \begin{array}{r}
   8\ 0\ 7\ 3\ 2\ 4\ 7 \\
   -\ 1\ 2\ 5\ 6\ 7\ 3\ 5 \\
   \hline
   \end{array}
   $$

   (b)
   $$
   \begin{array}{r}
   9\ 7\ 3\ 5\ 2\ 8\ 1\ 3 \\
   -\ 5\ 3\ 2\ 5\ 6\ 7\ 2\ 5 \\
   \hline
   \end{array}
   $$

   (c)
   $$
   \begin{array}{r}
   4\ 0\ 0\ 3\ 2\ 5\ 6\ 8 \\
   -\ 1\ 2\ 5\ 3\ 7\ 9\ 5\ 4 \\
   \hline
   \end{array}
   $$

4. The population of a town was 6,28,429 two years ago. It has increased by 7,30,158 since then. What is the total population of this town now?

5. The sum of three numbers is 9,32,75,189. If two of them are 2,50,38,156 and 4,79,28,389, find the third number.

6. Simplify :

   (a) 82,56,289 – 25,13,834 – 13,50,105 + 25,39,259

   (b) 5,78,18,288 + 20,139 – 2,56,32,590 + 28,389

   (c) 6,72,56,280 + 2,89,38,144 – ,77,50,199

Model Test Paper-I

[Based On Chapter 1 to 5]

1. Tick (✓) the correct option :

   (a) The place-value of 5 in 265,31,026 is :

   (i) 5 ☐ (ii) 500 ☐ (iii) 5,00,000 ☐

   (b) The smallest number using the digits 3, 6 and 4 is :

   (i) 346 ☐ (ii) 643 ☐ (iii) 364 ☐

   (c) The numbers to be added are called :

   (i) Addends ☐ (ii) Sum ☐ (iii) None of these ☐

   (d) The difference of the place-values of 7s in 7,62,715 is :

   (i) 6,99,300 ☐ (ii) 6,99,600 ☐ (iii) None of these ☐

   (e) The product of the greatest 3-digit number and the smallest 4-digit number is :

   (i) 9,990 ☐ (ii) 99,900 ☐ (iii) 9,99,000 ☐

2. Write the number names of each of the following numerals according to both Indian and International systems :

   (a) 3865425   (b) 9531243   (c) 5025672   (d) 1573452

3. Write the place-value of each digit in the following numerals :

   (a) 25,38,727   (b) 87,28,079   (c) 45,32,143   (d) 12,56,380

4. Find the sum of :

   (a) 3,57,218; 2,53,148 and 6,75,280

   (b) 13,25,183; 25,69,246 and 11,37,188

5. Find the difference between :

   (a) 28,03,187 and 22,59,972   (b) 47,69,288 and 12,32,566

6. A bus travels a distance of 325 km everyday. What distance will it travel in a year?

7. What is the difference between the greatest 6-digit number and 1 less than the smallest 7-digit number?

8. A number exceeds 8,76,53,472 by 232,54,153. What is the number ?

Test Sheet-III

[Based On Chapter 6 to 7]

1. Tick (✓) the correct option :

   (a) The number to be divided is called the :

   (i) Dividend ☐   (ii) Divisor ☐   (iii) Quotient ☐

   (b) In 2,450 ÷ 10, the remainder is :

   (i) 0 ☐   (ii) 90 ☐   (iii) 690 ☐

   (c) $\dfrac{5}{9}$ can be read as :

   (i) Nine over five ☐   (ii) Five over nine ☐   (iii) None of these ☐

   (d) $3\dfrac{5}{7}$ can be written as :

   (i) $3 + \dfrac{5}{7}$ ☐   (ii) $3 - \dfrac{5}{7}$ ☐   (iii) Both of these ☐

   (e) Which is smaller : $\dfrac{5}{9}$ or $\dfrac{5}{11}$?

   (i) $\dfrac{5}{9}$ ☐   (ii) $\dfrac{5}{11}$ ☐   (iii) Both are equal ☐

2. Divide and find the quotient and the remainder of each of the following :

   (a) 4,26,540 ÷ 20   (b) 7,94,004 ÷ 36   (c) 2,93,224 ÷ 540

3. Write the numerator and the denominator of each of the following :

   (a) $\dfrac{10}{17}$ (b) $\dfrac{1}{9}$ (c) $\dfrac{13}{21}$ (d) $\dfrac{41}{56}$

4. Find the missing numbers to make the statements true :

   (a) $\dfrac{3}{5} = \dfrac{\square}{15}$ (b) $\dfrac{9}{11} = \dfrac{18}{\square}$ (c) $\dfrac{7}{15} = \dfrac{21}{\square}$ (d) $\dfrac{4}{9} = \dfrac{\square}{72}$

5. Convert the following into improper fractions :

   (a) $1\dfrac{1}{10}$ (b) $7\dfrac{1}{5}$ (c) $9\dfrac{5}{11}$ (d) $6\dfrac{7}{8}$

6. Mr. Mukesh filled litres of petrol in his bike in the morning. In the evening, $\dfrac{9}{5}$ litres of petrol was left in the bike. How much petrol was consumed?

Test Sheet-IV

[Based On Chapter 8 to 9]

1. Tick (✓) the correct option :

   (a) 1 cm = _____ mm.

   (i) 10 ☐ (ii) 100 ☐ (iii) 1000 ☐

   (b) 1 kl = _____ hl.

   (i) 10 ☐ (ii) 100 ☐ (iii) 1000 ☐

   (c) 8020 l = _____ kl.

   (i) 802 ☐ (ii) 80.20 ☐ (iii) 8.020 ☐

   (d) A quadrilateral with one pair of opposite side parallel is called :

   (i) Trapezium ☐ (ii) Rhombus ☐ (iii) Parallelogram ☐

   (e) $\frac{1}{4}$ of right angle is equal to :

   (i) 15° ☐ (ii) 45° ☐ (iii) None of these ☐

2. Convert each of the following as directed :

   (a) 9.25 dg to hg

   (b) 8.02 mg into g

   (c) 15.36 km into hm and m

3. Fill in the blanks :

   (a) 6 km = _____ m   (b) 247 mg = _____ cg (c) 435 ml = _____ l

4. A container can hold 26 l 280 ml of water. 36 such containers can fill up a tank. Express the answer in litres.

5. Find the diameters of the circles with the following circumferences :

   (a) 28 cm   (b) 26.4 cm   (c) 16 cm   (d) 42 cm

6. Construct an equilateral triangle of side 6 cm each. Measure its angles. Are all these angles equal?

Model Test Paper-II

[Based On Chapter 6 to 10]

1. Tick (✓) the correct option :

   (a) In a division problem, remainder is always less than the divisor. Is it true?

   (i) Yes ☐   (ii) No ☐   (iii) Sometimes ☐

   (b) Which of the following is an improper fraction?

   (i) $\frac{3}{2}$ ☐   (ii) $1\frac{7}{5}$ ☐   (iii) $\frac{7}{19}$ ☐

   (c) 375 g = _____ mg.

   (i) 3750 ☐   (ii) 37500 ☐   (iii) 375000 ☐

   (d) A triangle in which only two sides are of different length is called :

   (i) Scalene triangle ☐   (ii) Isosceles triangle ☐   (iii) Equilateral triangle ☐

   (e) 1 year = _____ days.

   (i) 365 ☐   (ii) 366 ☐   (iii) 367 ☐

2. Divide and verify your answers :

   (a) 4,56,283 ÷ 25 ☐   (b) 4,36,800 ÷ 100 ☐   (c) 1,41,685 ÷ 215 ☐

3. Write two equivalent fractions for each of the following :

   (a) $\frac{1}{7}$ (b) $\frac{2}{7}$ (c) $\frac{7}{9}$ (d) $\frac{11}{15}$

4. Solve the following :

   (a) $\frac{8}{7} + \frac{2}{5}$ (b) $\frac{3}{9} - \frac{1}{12}$ (c) $\frac{4}{9} + \frac{5}{7}$ (d) $\frac{3}{7} - \frac{4}{20}$

5. Convert the following :

   (a) 450 g 256 mg into mg   (b) 49.25 km into hm and m

   (c) 46.25 *l* into *ml*   (d) 10456 *dal* into *dl* and *cl*

6. Draw 75° and 180° angles using a protractor.

7. Construct a triangle in which AB = 4 cm, BC = 4.5 cm, CA = 3.5 cm.

8. Sheena spends 3 hrs 25 min in a gum daily. Raj spends 180 min daily. Who spends more time?

Answersheet

Chapter 1

1. (a) Thirty seven thousand two hundred eight three (b) Fifteen thousand ninety six (c) Three lakh forty eight thousand one hundred fifty four (d) Six lakh ninety thousand two hundred (e) Thirteen lakh forty two thousand five hundred sixty (f) Fifty four lakh ten thousand three hundred nine **2.** (a) 50,608 (b) 13,82,900 (c) 6,45,812 (d) 2,972 (e) 94,35,641 (f) 18,46,787 **3.** (a) 548; 550 (b) 1829, 1831; (c) 67,152; 67,154 (d) 29, 199; 29, 201 (e) 3, 86, 188; 3, 86, 190 (f) 2, 49, 567; 2, 49, 569 **4.** (a) 40,000 + 2,000 + 800 + 30 + 5 (b) 50,000 + 3,000 + 100 + 0 + 6 (c) 3,00,00 + 10,000 + 800 + 20 + 5 (d) 6,00,000 + 70,000 + 2,000 + 100 + 80 + 9 (e) 60,00,000 + 2,00,000 + 50,000 + 4,000 + 100 + 30 + 8 (f) 90,00,000 + 1,00,000 + 10,000 + 2,000 + 500 + 40 **5.** (a) 61,259 (b) 36,897 (c) 1,50,972 (d) 9,24,681 (e) 34,57,315 (f) 70,64,269 **6.** (a) 100 (b) 60,000 (c) 6 (d) 0 (e) 7,000 (f) 80,00,000 **7.** (a) 423;753;892;1250;1750;3,186 (b) 4,256; 7,543; 13,754; 18,286; 26,432; 50,183 (c) 2,543; 18,540; 28,653; 1,34,250; 1,75,289; 3,56,730 (d) 6,435; 13,496; 18,726; 54,280; 79,342; 2,54,180 **8.** (a) 43,506; 36,148; 29,400; 15,732; 9,832; 1,742 (b) 2,56,143; 70,158; 49,548; 32,189; 28,567; 17,534 (c) 65,183; 51,256; 42,509; 31,420; 25,193; 6,543 (d) 7,54,320; 5,42,568; 3,10,893; 1,89,720; 72,543; 15,387 **9.** (a) 751,157 (b) 820,208 (c) 973,379 (d) 962,269 (e) 874,478 (f) 985,589 **10.** (a) 391699 (b) 692028 (c) 540359 (d) 4409244 (e) 5673293 **11.** (a) 124277 (b) 243243 (c) 517875 (d) 4891116 (e) 4026195 **12.** (a) 27094 (b) 168720 (c) 156320 (d) 5376 (e) 10626 (f) 7614 **13.** (a) 9 (b) 49 (c) 18 (d) 121 (e) 297 (f) 211 **14.** (a) ₹ 37 p 75 (b) ₹ 311 p 88 (c) ₹ 861 p 584 (d) 46 m 53 cm (e) 242 km 398 m (f) 295 kg 378 g **15.** (a) ₹ 13 p 21 (b) ₹ 9 p 32 (c) ₹ 110 p 82 (d) 25 m 89 cm (e) 28 l 15 ml (f) 398 kg 286 g **16.** ₹ 14,750 **17.** 1158 **18.** 145

19. (a) 1 (b) $\frac{8}{7}$ (c) $\frac{14}{9}$ (d) $\frac{10}{8}$ (e) 1 (f) $\frac{10}{7}$ **20.** (a) $\frac{3}{9}$ (b) $\frac{1}{7}$ (c) $\frac{4}{12}$ (d) $\frac{1}{11}$ (e) $\frac{1}{5}$ (f) $\frac{4}{8}$ **21.** (a) 1:40 (b) 12:30 (c) 9:05 (d) 3:40 (e) 9:25 (f) 11:35 **23.** AB, BC, CD, DE, EA **25.** (a) three (b) six (c) eight (d) one, one (e) two, no (f) one, no

Chapter 2

Exercise - 2 (A)

1. (a) 54,32,671 (b) 10,85,426 (c) 3,75,32,148 (d) 4,26,42,093 (e) 6,72,54,890 (f) 7,00,84,793 (g) 1,47,95,625 (h) 3,16,49,807 **2.** (a) 13,246 (b) 725,439 (c) 1,856,725 (d) 5,708,348 (e) 97,175,473 (f) 63,480,975 (g) 38,742,692 (h) 14,709,725 **3.** (a) Seven lakh twenty five thousand six hundred forty three (b) Forty two lakh fifty thousand one hundred eighty nine (c) Seven crore fifty six lakh thirty nine thousand two hundred fifty eighty (d) Eight crore fourteen lakh thirty four thousand one hundred eighty (e) Six crore eight lakh ten thousand three hundred ninety six (f) Ninety four lakh eighteen thousand two hundred ninety seven (g) Three crore forty nine lakh twelve thousand five hundred forty three (h) Two crore fifty four lakh twenty nine thousand three hundred fifty six **4.** (a) Seventeen million five hundred forty two thousand one hundred eighty nine (b) Two million five hundred forty three thousand eight hundred seventy two (c) Seven million four hundred thirty one thousand six hundred fifty two (d) Fifty nine million one hundred thirty four thousand two hundred four (e) Eighty four million three hundred twenty four thousand six hundred fifty four (f) Four million seven hundred twenty thousand nine hundred fifty six (g) Ninety five million two hundred thirty one thousand eight hundred seventy six (h) Thirty one million eight hundred twenty thousand five hundred sixty four **5.** (a) 65,122 (b) 5,82,067 (c) 1,00,025 (d) 37,40,396 (e) 4,20,64,255 (f) 1,92,05,000 **6.** (a) 602,560 (b) 900,041 (c) 1,275,309 (d) 4,506,409 (e) 12,807,541 (f) 61,503,009

Exercise - 2 (B)

1. (a) 5 (b)) 6 (c) 1 (d) 4 (e) 0 (f) 9 (g) 8 (h) 8 (i) 7 **2.** (a) 9,00,000 (b) 0 (c) 50,00,000 (d) 90,000 (e) 9 (f) 8,00,00,000 (g) 7,00,000 (h) 70,000 (i) 90,00,000 **3.** (a) 10,00,000 + 3,00,000 + 50,000 + 4,000 + 200 + 10 + 8 (b) 9,00,000 + 40,000 + 6,000 + 500 + 0 + 8 (c) 3,00,00,000 + 20,00,000 + 0 + 0 + 9,000 + 100 + 40 + 3 (d) 4,00,00,000 + 70,00,000 + 3,00,000 + 10,000 + 2,000 + 400 + 10 + 9 (e) 50,00,000 + 6,00,000 + 30,000 + 0 + 0 + 0 + 9 (f) 7,00,00,000 + 40,00,000 + 8,00,000 + 10,000 + 9,000 + 300 + 50 + 6 (g) 1,00,00,000 + 0 + 0 + 0 + 0 + 200 + 80 + 5 (h) 4,00,000 + 60,000 + 7,000 + 300 + 90 + 5 (i) 30,00,000 + 7,00,000 + 50,000 + 4,000 + 100 + 80 + 9 **4.** (a) 75,19, 381 (b) 4,68,258 (c) 6,72,10,600 (d) 1,73,42,594 (e) 81,72, 010 (f) 3,14,567 (g) 8,96,34,189 (h) 27,59,143 (i) 6,34,561 **5.** (a) 1,89,319 (b) 6,75,434 (c) 8,99,92,179 (d) 31,56,893 (e) 21,56,487 (f) 7,56,24,398 (g) 2,64,395 (h) 17,45,391 (i) 1,20,56,142

Exercise - 2 (C)

1. (a) > (b) < (c) > (d) < (e) > (f) < (g) > (h) > (i) > (j) > (k) > (l) > **2.** (a) 40,065; 1,39,450; 7,14,125; 31,75,450; 42,54,387 (b) 73,145; 89,100; 7,54,187; 9,38,430; 28,14,364 (c) 1,34,50,257; 2,51,24,183; 3,09,41,206; 5,17,68,142; 8,73,48,142 (d) 88,438; 4,72,409; 6,03,187; 9,54,985; 9,65,182 (e) 75,050; 70,005; 1,70,050; 2,70,503; 56,75,000 **3.** (a) 8,57,14,289; 7,25,147; 5,60,389; 1,28,436; 14,069 (b) 85,74,183; 75,24,186; 61,38,472; 7,42,507; 3,19,428 (c) 9,30,18,725; 9,25,14,753; 6,42,80,567; 18,75,147; 8,75,483 (d) 92,65,407; 75,28,147; 9,42,286; 6,38,496; 5,46,753 (e) 1,20,05,479; 85,74,549; 56,89,385; 9,75,975; 4,75,389 **4.** (a) 5,343; 5,353; 5,363 (b) 42,56,144; 42,56,146; 42,56,148 (c) 17,349; 17,449; 17,549 (d) 81,43,425; 81,53,425; 81,63,425 (e) 31,56,720; 31,56,725; 31,56,730

Exercise - 2 (D)

1. (a) 238 (b) 507 (c) 257 **2.** (a) 2058 (b) 1257 (c) 2089 **3.** (a) 762 (b) 930 (c) 852 **4.** (a) 9751 (b) 8430 (c) 9852 **5.** 577 **6.** 909 **7.** 3699 **8.** 6067 **9.** 7644 **10.** 9930.

Multiple Choice Questions (MCQs)

1. (c); **2.** (a); **3.** (b); **4.** (c); **5.** (a); **6.** (c); **7.** (b); **8.** (a); **9.** (b); **10.** (b); **11.** (a)

Chapter 3

Exercise – 3 (A)

1. (a) 5983938; (b) 3867924; (c) 8596647; (d) 5977578; (e) 9868759; (f) 9738986; (g) 95775645; (h) 68784598; (i) 84969639; (j) 87566673; (k) 57987969; (l) 87789967; **2.** (a) 3775359; (b) 4967458; (c) 37376564; (d) 59874399; (e) 5689769; (f) 7878896

Exercise – 3 (B)

1. (a) 8868903; (b) 6023870; (c) 6044392; (d) 8024400 (e) 7151313; (f) 8431402 (g) 80081542 (h) 79332701; (i) 87322831; (j) 40443909; (k) 70437971; (l) 79247596; **2.** (a) 4023815; (b) 8510433; (c) 59886318 (d) 48522962; (e) 7441935; (f) 93671741

Exercise – 3 (C)

1. 11,568; **2.** 11,38,540; **3.** 26,72,387; **4.** 10,00,281; **5.** 10,000; **6.** 17,25,463; **7.** 0; **8.** 17,963; **9.** 28,356; **10.** 49,348

Exercise – 3 (D)

1. 2,70,593; **2.** 1,60,88,675; **3.** 1,82,983; **4.** 1,62,300; **5.** 9,09,07,625; **6.** 3,19,817 km; **7.** 1,42,051; **8.** 95,746; **9.** 3,84,575; **10.** 82,162

Multiple Choice Questions (MCQs)

1. (a); **2.** (b); **3.** (b); **4.** (c); **5.** (b) **6.** (b); **7.** (a); **8.** (b); **9.** (a); **10.** (b) **11.** (a) and (b); **12.** (c)

Chapter 4

Exercise – 4 (A)

1. (a) 6226111; (b) 1771110; (c) 3313414; (d) 4314232; (e) 6422501; (f) 2311116; (g) 12110142; (h) 71111141; (i) 11112423; (j) 55161142; (k) 53112025; (l) 72121322; **2.** (a) 6314133; (b) 2201117; (c) 11211112; (d) 14174171; (e) 11114211; (f) 1131133;

Exercise – 4 (B)

1. (a) 2377848; (b) 2754686; (c) 4921625; (d) 3180525; (e) 4115477; (f) 4275322; (g) 58637535; (h) 51086891; (i) 19360024; (j) 25878682; (k) 42183157; (l) 46676129; **2.** (a) 2334719; (b) 4787344; (c) 1104669; (d) 1491194; (e) 11060088; (f) 29167769;

Exercise – 4 (C)

1. 1326251; **2.** 906931; **3.** 17899320; **4.** 34158461; **5.** 50894891; **6.** 67887791; **7.** 4882241; **8.** 2016696; **9.** 3902609; **10.** 4933969

Exercise – 4 (D)

1. 316889; **2.** 34318; **3.** 510793; **4.** 316700; **5.** 1670328; **6.** 23306; **7.** 30,839; **8.** 45895590; **9.** 15075; **10.** 3354969;

Exercise – 4 (E)

1. 420847; **2.** 107040; **3.** 1987387; **4.** 455487; **5.** 4208372 **6.** 2182663; **7.** 20019095; 43650800

Exercise – 4 (F)

1. 1245251; **2.** 14637; **3.** 26904788; **4.** 43047; **5.** 499280; **6.** 25937159; **7.** 40914; **8.** 51428

Multiple Choice Questions (MCQs)

1. (b) **2.** (a) **3.** (c) **4.** (a) **5.** (c) **6.** (c) **7.** (a) **8.** (b) **9.** (b) **10.** (a)

Chapter 5

Exercise – 5 (A)

1. (a) 632; (b) 13; (c) 4,960; (d) 0; (e) 9,728; (f) 0; (g) 39; (h) 145; (i) 26; (j) 20; (k) 75; (l) 85;104 **2.** (a) 4390 (b) 12470 (c) 167340 (d) 95200 (e) 368000 (f) 4138700 (g) 368000 (h) 2567000 (i) 93080000 **3.** (a) 167120 (b) 64270 (c) 213150 (d) 196000 (e) 52200 (f) 1527300 (g) 1716000 (h) 2322000 (i) 2272000 (j) 1834000 (k) 345000 (l) 4781000

Exercise – 5 (B)

1. (a) 7800 (b) 406182 (c) 134890 (d) 44268 (e) 283824 (f) 88011 (g) 102753 (h) 141408 (i) 1167993 (j) 1278852 (k) 424464 (l) 1041687 **2.** (a) 8502 (b) 4998 (c) 20394 (d) 54327 (e) 221728 (f) 260022 (g) 631728 (h) 679395 (i) 541825

Exercise – 5 (C)

1. (a) 108433 (b) 85842 (c) 46102 (d) 240284 (e) 309170 (f) 917316 (g) 3077315 (h) 814112 (i) 7358284 (j) 8215989 (k) 14698125 (l) 3190976 **2.** (a) 195096 (b) 57375 (c) 187128 (d) 463572 (e) 1082532 (f) 832356 (g) 2862592 (h) 2808090 (i) 13406244

Exercise – 5 (D)

1. 268640 **2.** 9900 **3.** 62060 **4.** 947856 **5.** 481680 **6.** 252840 **7.** 118625 **8.** 1203450 **9.** 85,000 **10.** 44280

Multiple Choice Questions (MCQs)

1. (b) **2.** (a) **3.** (c) **4.** (b) **5.** (a) **6.** (b) **7.** (c) **8.** (c) **9.** (b) **10.** (c) **11.** (c), **12.** (b)

Chapter 6

Exercise – 6 (A)

1. (a) Q = 562, R = 0 ; (b) Q = 6832, R = 0; (c) Q = 5649, R = 4 (d) Q = 5698, R = 0; (e) Q = 58974, R = 0; (f) Q = 45123, R = 0; (g) Q = 1496, R = 3; (h) Q = 56231, R = 0; (i) Q = 69835, R = 1; (j) Q = 85674, R = 0; (k) Q = 222530, R = 2; (l) Q = 19279, R = 0 **2.** (a) 62598; (b) 171002; (c) 113918; (d) Q = 107099, R = 3; (e) 49296, R = 2; (f) Q = 72971, R = 3

Exercise – 6 (B)

1. (a) Q = 6963, R = 8; (b) Q = 4959; R = 1, (c) Q = 104, R = 2; (d) Q = 3044, R = 2; (e) Q = 7332, R = 8; (f) Q = 5042, R = 9, (g) Q = 21,327, R = 0; (h) 23,634, R = 1; (i) Q = 20102; R = 15, (j) Q = 54564, R = 4; (k) Q = 10561, R = 26; (l) Q = 13392, R = 14 **2.** (a) Q = 462, R = 5; (b) Q = 3040, R = 8; (c) Q = 2418, R = 26, (d) Q = 9879, R = 0; (e) Q = 22055, R = 24; (f) Q = 6049, R = 30

Exercise - 6 (C)

1. (a) Q = 562, R = 0; (b) Q = 653, R = 1; (c) Q = 421, R = 0; (d) Q = 4873, R = 0; (e) Q = 126, R = 5; (f) Q = 458, R = 0, (g) Q = 457, R = 0; (h) Q = 2256, R = 4; (i) Q = 782, R = 7; (j) Q = 485, R = 0; (k) Q = 543, R = 4; (l) Q = 1564, R = 0 **2.** (a) Q = 6015, R = 10; (b) Q = 896, R = 2; (c) Q = 564, R = 0; (d) Q = 142, R = 180; (e) Q = 546, R = 9; (f) Q = 845, R = 0

Exercise - 6 (D)

1. (a) Q = 38, R = 5; (b) Q = 752, R = 6; (c) Q = 4280, R = 5; (d) Q = 5492, R = 6; (e) Q = 2640, R = 79; (f) Q = 7848, R = 0; (g) Q = 456, R = 24; (h) Q = 570, R = 4; (i) Q = 3420, R = 0, (j) Q = 8964, R = 0; (k) Q = 4920, R = 60; (l) Q = 6502, R = 0; (m) Q = 65, R = 3; (n) Q = 325, R = 900; (o) Q = 278, R = 125, (p) Q = 420, R = 6; (q) Q = 120, R = 100; (r) Q = 156, R = 9

Exercise - 6 (E)

1. 65; **2.** 125; **3.** 1244, 9; **4.** 1256, 7; **5.** 5500; **6.** 2546; **7.** 8545; **8.** 5469, 6; **9.** 98; **10.** 2450

Multiple Choice Questions (MCQs)
1. (b); **2.** (b) ; **3.** (a) ; **4.** (c) **5.** (b) **6.** (a) ; **7.** (a); **8.** (c); **9.** (b)

Chapter 7

Exercise - 7 (A)

1. (a) $\frac{3}{4}$, $\frac{1}{4}$; (b) $\frac{3}{8}$, $\frac{5}{8}$; (c) $\frac{2}{6}$, $\frac{4}{6}$; (d) $\frac{4}{9}$, $\frac{5}{9}$; (e) $\frac{4}{8}$, $\frac{4}{8}$; (e) $\frac{1}{6}$, $\frac{5}{6}$;

4. (a) $\frac{4}{7}$; (b) $\frac{1}{8}$; (c) $\frac{2}{9}$; (d) $\frac{3}{5}$; (e) $\frac{5}{6}$; (f) $\frac{4}{9}$; (g) $\frac{9}{11}$; (h) $\frac{13}{15}$; (i) $\frac{6}{7}$; (j) $\frac{1}{11}$; (k) $\frac{5}{12}$; (l) $\frac{11}{16}$; **5.** (a) Seven over nine; (b) Five over eight; (c) Eleven over thirteen (d) Fourteen over fifteen; (e) Eight by seventeen; (f) Three by eleven (g) six by nineteen; (h) One-tenth; (i) Six-twenty fifths (j) Nine-elevenths; (k) Two by twenty one;(l)Eight-Nineteenths

6. (a) $\frac{1}{6}$; (b) $\frac{4}{9}$; (c) $\frac{7}{12}$; (d) $\frac{3}{19}$; (e) $\frac{9}{10}$;(f) $\frac{11}{14}$

Exercise - 7 (B)

1. (a) N = 3, D = 7 ; (b) N = 10, D = 13; (c) N = 5, D = 9 ; (d) N = 11, D = 14; (e) N = 9, D = 13; (f) N = 14, D = 27

2. (a) $\frac{8}{11}$; (b) $\frac{3}{7}$; (c) $\frac{9}{13}$; (d) $\frac{10}{21}$; (e) $\frac{7}{9}$; (f) $\frac{15}{16}$

3. (a) 4 ; (b) 3 ; (c) 3; (d) 2 **4.** (a) Two ; (b) Three ; (c) Four ; (d) Six ; (e) Two ;(f) Five

5. (a) ; (b) ; (c) ;

(d) ; (e) ;(f) (g)

(h) ; **6.** (a) $\frac{6}{8}$; (b) $\frac{4}{8}$; (c) $\frac{5}{8}$; (d) $\frac{7}{8}$

Exercise - 7 (C)

1. (a) $\frac{2}{10}$, $\frac{3}{15}$, $\frac{4}{20}$, $\frac{5}{25}$, $\frac{6}{30}$, $\frac{7}{35}$; (b) $\frac{4}{14}$, $\frac{6}{21}$, $\frac{8}{28}$, $\frac{10}{35}$, $\frac{12}{42}$, $\frac{14}{49}$;

(c) $\frac{8}{20}$, $\frac{12}{30}$, $\frac{16}{40}$, $\frac{20}{50}$, $\frac{24}{60}$, $\frac{28}{10}$; (d) $\frac{16}{18}$, $\frac{24}{27}$, $\frac{32}{36}$, $\frac{40}{45}$, $\frac{48}{54}$, $\frac{56}{63}$;

(e) $\frac{6}{20}$, $\frac{9}{30}$, $\frac{12}{40}$, $\frac{15}{50}$, $\frac{18}{60}$, $\frac{27}{70}$; (f) $\frac{10}{12}$, $\frac{15}{18}$, $\frac{20}{24}$, $\frac{25}{30}$, $\frac{30}{36}$, $\frac{35}{42}$;

(g) $\frac{2}{16}$, $\frac{3}{24}$, $\frac{4}{32}$, $\frac{5}{40}$, $\frac{6}{48}$, $\frac{7}{56}$; (h) $\frac{6}{8}$, $\frac{9}{12}$, $\frac{12}{16}$, $\frac{15}{20}$, $\frac{18}{24}$, $\frac{21}{28}$

2. (a) 12 ; (b) 2 ; (c) 28 ; (d) 9 ; (e) 30 ; (f) 77 **3.** (a) 26; (b) 40 ; (c) 35 ; (d) 45 ; (e) 63 ; (f) 28 **4.** (a) $\frac{5}{28}$; (b) $\frac{4}{10}$; (c) $\frac{3}{6}$; (d) $\frac{6}{8}$

5. (a) Yes; (b) Yes ; (c) No; (d) No; (e) Yes; (f) Yes

6. (a) $\frac{21}{24}$; (b) $\frac{35}{40}$; (c) $\frac{14}{16}$; (d) $\frac{56}{64}$; **7.** (a) $\frac{7}{21}$; (b) $\frac{2}{6}$; (c) $\frac{28}{84}$;(d) $\frac{42}{126}$

Exercise - 7 (D)

1. a, b, e, f, g, h **2.** b, c, e, f, g **3.** a, c, e, g, h **4.** (a) $\frac{25}{7}$; (b) $\frac{47}{9}$; (c) $\frac{65}{8}$; (d) $\frac{55}{8}$; (e) $\frac{13}{12}$; (f) $\frac{50}{13}$; (g) $\frac{104}{11}$; (h) $\frac{21}{13}$

5. (a) $4\frac{3}{6}$; (b) $2\frac{5}{7}$; (c) $9\frac{2}{4}$; (d) $23\frac{3}{4}$; (e) $50\frac{1}{2}$; (f) $18\frac{2}{3}$; (g) $8\frac{9}{10}$; (h) $9\frac{1}{11}$

Exercise - 7 (E)

1. (a) < ; (b) > ; (c) > ; (d) < ; (e) > ; (f) < ; (g) < ; (h) < ; (i) > ; (j) < ; (k) > ; (l) > **2.** (a) $\frac{2}{5}$; (b) $\frac{4}{9}$; (c) $\frac{10}{17}$; (d) $\frac{9}{16}$; (e) $\frac{6}{11}$; (f) $\frac{7}{11}$; (g) $\frac{3}{4}$; (h) $\frac{9}{10}$; (i) $\frac{3}{5}$; (j) $\frac{5}{6}$; (k) $\frac{3}{7}$; (l) $\frac{5}{8}$

3. (a) $\frac{6}{11}$; (b) $\frac{3}{16}$; (c) $\frac{2}{5}$; (d) $\frac{4}{5}$; (e) $\frac{1}{5}$; (f) $\frac{5}{21}$; (g) $\frac{1}{7}$; (h) $\frac{3}{10}$; (i) $\frac{1}{9}$; (j) $\frac{2}{7}$; (k) $\frac{7}{10}$; (l) $\frac{1}{9}$

4. (a) $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{7}{5}$, $\frac{8}{5}$ (b) $\frac{1}{9}$, $\frac{2}{9}$, $\frac{4}{9}$, $\frac{5}{9}$, $\frac{7}{9}$ (c) $\frac{11}{19}$, $\frac{11}{17}$, $\frac{11}{16}$, $\frac{11}{15}$, $\frac{11}{13}$ (d) $\frac{9}{17}$, $\frac{9}{15}$, $\frac{9}{12}$, $\frac{9}{11}$, $\frac{9}{10}$

5. (a) $\frac{7}{19}$, $\frac{6}{19}$, $\frac{4}{19}$, $\frac{3}{19}$, $\frac{1}{19}$ (b) $\frac{11}{15}$, $\frac{9}{15}$, $\frac{8}{15}$, $\frac{7}{15}$, $\frac{2}{15}$ (c) $\frac{10}{11}$, $\frac{10}{17}$, $\frac{10}{19}$, $\frac{10}{21}$, $\frac{10}{25}$ (d) $\frac{15}{16}$, $\frac{15}{17}$, $\frac{15}{22}$, $\frac{15}{23}$, $\frac{15}{24}$

Exercise - 7 (F)

1. (a) $\frac{3}{5}$; (b) $\frac{10}{11}$; (c) $\frac{13}{9}$; (d) $\frac{11}{29}$; (e) $\frac{11}{22}$; (f) $\frac{23}{8}$; (g) $\frac{7}{6}$; (h) $\frac{117}{154}$; (i) $\frac{7}{7}$; (j) $\frac{14}{14}$; (k) $\frac{22}{24}$; (l) $\frac{13}{12}$; (m) $\frac{354}{185}$;(n) $\frac{59}{40}$; (o) $\frac{32}{36}$; (p) $\frac{13}{12}$

2. (a) $\frac{12}{16}$; (b) $\frac{7}{13}$; (c) $\frac{3}{4}$; (d) $\frac{9}{12}$; (e) $\frac{7}{8}$; (f) $\frac{61}{63}$; (g) $\frac{6}{5}$; (h) $\frac{35}{40}$; (i) $\frac{29}{36}$; (j) $\frac{17}{16}$; (k) $\frac{292}{231}$;(l) $\frac{27}{42}$

Exercise - 7 (F)

1. (a) $\frac{6}{11}$; (b) $\frac{2}{5}$; (c) $\frac{6}{10}$; (d) $\frac{1}{7}$; (e) $\frac{11}{30}$; (f) $\frac{1}{12}$; (g) $\frac{19}{65}$; (h) $\frac{5}{15}$; (i) $\frac{2}{45}$; (j) $\frac{1}{21}$; (k) $\frac{16}{35}$; (l) $\frac{9}{22}$

2. (a) $\frac{4}{12}$; (b) $\frac{37}{72}$; (c) $\frac{1}{11}$; (d) $\frac{1}{40}$; (e) $\frac{19}{63}$; (f) $\frac{19}{36}$; (g) $\frac{1}{14}$; (h) $\frac{1}{10}$; (i) $\frac{29}{84}$

Exercise - 7 (H)

1. Jenny, $\dfrac{13}{30}$ m **2.** $\dfrac{53}{42}$ kg ; **3.** $\dfrac{623}{90}$ kg; **4.** $\dfrac{1249}{280}$ **5.** $\dfrac{27}{40}$ lit; **6.** $\dfrac{11}{12}$ **7.** $\dfrac{599}{40}$ **8.** $\dfrac{23}{56}, \dfrac{33}{56}$

Multiple Choice Questions (MCQs)
1. (b) ; **2.** (b) ; **3.** (b); **4.** (a) ; **5.** (a) ; **6.** (a), **7.** (c); **8.** (a); **9.** (b); **10.** (b); **11.** (a); **12.** (b)

Chapter 8

Exercise - 8 (A)

1. (a) 1.8 (b) 1.8 (c) 320 (d) 4.2 (e) 0.35 (f) 32 (g) 4700 (h) 1 (i) 272500 (j) 0.32 **2.** (a) 1825 cm (b) 68240 dm (c) 36 m (d) 78 hm 45 m (e) 72640 dm (f) 30 dam (g) 7 m 825 m (h) 5 km 50 m (i) 4 m 8 cm (j) 0.2875 dam (k) 36 m (l) 4 m 825 mm **3.** (a) 5.5 km, 5500 m (b) 170.84 km, 17084 m; (c) 23.726 km, 23726 m; (d) 40 km 500 m, 40500 m; (e) 25 km 804 m, 25.804 km, (f) 4.11 m, 411 cm; (g) 9.7 cm, 7 mm **4.** (a) 0.05 km, (b) 300; (c) 200; (d) 100; (e) 100; (f) 600; (g) 0.1 (h) 500 (i) 700

Exercise - 8 (B)

1. (a) 43 km 070 m (b) 62 m 645 mm (c) 67 m 19 cm (d) 3 km 782 m (e) 628 m (f) 80 km 175 m (g) 45 m 17 cm (h) 37 km 425 m **2.** 129 m 6 cm, 4775 m 22 cm **3.** 73 m 408 cm **4.** 858 m **5.** 1 km 620 m **6.** 40.737 km **7.** 78 m 14 cm (approx).

Exercise - 8 (C)

1. (a) 325 g (b) 3700 g (c) 7250 g (d) 2700 g **2.** (a) 5080 g (b) 98670 mg (c) 450256 mg (d) 48 kg 293 g **3.** (a) 1 kg 290 g (b) 0.07894 kg (c) 56.83 dag (d) 529 g 8 dg **4.** (a) 0.4 kg (b) 1.140 kg (c) 0.680 kg (d) 6.750 kg **5.** (a) 235000 (b) 6840 (c) 0.5 (d) 0.0487 (e) 439000 (f) 2.247 (g) 72800 (h) 88.9 (i) 0.070 (j) 5650 **6.** (a) 117 kg 820 g (b) 18 g 211 mg (c) 116.718 g (d) 28.585 g **7.** 6467 kg 03 g **8.** 6 kg 995 g **9.** 704.32 kg (approx) **10.** 4.5 kg **11.** 9.12 kg (approx) **12.** 14 kg 50 g

Exercise - 8 (D)

1. (a) 37000, 37000000 (b) 207.5, 20750, (c) 4.702, 0.4702, (d) 2.345, 0.2345 (e) 7.39, 0.00739 (f) 32.51, 325.1 **2.** (a) 400 (b) 7 (c) 38.4 (d) 0.004 (e) 1.842 (f) 1060 **3.** (a) 329 *kl* 400 *l* (b) 354 *cl* (c) 46250 *ml* (d) 348.9 *dal* (e) 4 *hl* 9000 *cl* (f) 1045 *dl* 6000 *cl* **4.** (a) 5.342 *kl* (b) 3 *l* 2 *ml* (c) 2 *hl* 689 *dl* (d) 6 *dal* 40.8 *l* (e) 8.456 *l* (f) 19 *kl* 25 *l* **5.** (a) > (b) = (c) < (d) > (e) > (f) < **6.** (a) 127 *l* 270 *ml* (b) 150 *l* 27 *cl* (c) 10 *kl* 982 *l* (d) 8 *l* 8 *ml* **7.** 25 *l* 217 *ml* **8.** 7 *l* 675 *ml* **9.** 946.08 *l* **10.** 303.89 *l* (approx) **11.** 126.02 *l*, 2142.34 *l* **12.** 32.46 *l*

Multiple Choice Questions (MCQs)
1. (b) **2.** (c) **3.** (a) **4.** (a) **5.** (c) **6.** (c) **7.** (a) **8.** (b) **9.** (c) **10.** (c)

Chapter 9

Exercise - 9 (A)

1. (a) Line (b) Ray (c) Line Segment AB or BA (d) Point (e) Plane (f) Plane **6.** (a) and (c) **7.** (a) ∠AOB and ∠BOA (b) ∠PQR and ∠RQP (c) ∠XYZ, ∠ZYX (d) ∠BAC, ∠CAB and ∠Z **8.** (a) ∠XYZ, ∠YXZ, ∠XZY (b) ∠1, ∠2, ∠3, ∠4 (c) ∠a, ∠b, ∠c, ∠d, ∠e, ∠f **12.** (a) F (b) F (c) T (d) T (e) T (f) T

Exercise - 9 (B)

1. (a) ∠AOB, ∠AOC and ∠BOC, all acute angles. (b) ∠POR obtuse, ∠ROQ Obtuse and ∠POQ right angle (c) ∠XOY acute-angle **5.** (a) 45° (b) 30° (c) 180° (d) 360° **6.** (a) Right (b) Straight (c) Degrees (d) Vertex (e) Acute **7.** (a) Obtuse (b) Acute (c) Obtuse (d) Acute

Exercise - 9 (C)

1. (a) and (c) **2.** (a) and (d) **3.** (a), (b), (c), (d) **4.** (a) Acute

angled triangle (b) Right angled triangle (c) Obtuse angled triangle **5.** (a) Right angled triangle (b) Acute angled triangle (c) Obtuse angled triangle **6.** (a) Scalene triangle (b) Equilateral triangle (c) Isosceles triangle **7.** (a) 65° (b) 55° (c) 30° (d) 100° **8.** only one , Q **10.** ∠60°, all angles equal **14.** (a) Obtuse (b) 60° (c) Isosceles (d) Scalene **15.** (a) T (b) F (c) F (d) T (e) T

Exercise - 9 (D)

1. (a) 8 cm (b) 11 cm (c) 5.2 cm (d) 14 cm **2.** 2.5 cm **3.** (a) 24 cm (b) 105 mm (c) 12.6 cm (d) 45 cm (e) 376.8 mm (f) 30 cm **4.** (a) 9 cm (b) 46 mm (c) 10.8 cm (d) 40 mm **5.** (a) 6 cm (b) 8.8 cm (c) 20.66cm **6.** No **7.** (a) No (b) Longest (c) Radius (d) Three **8.** 1. Square 2. Rectangle 3. Trapezium 4. Rhombus

Multiple Choice Questions (MCQs)

1. (b), **2.** (c) **3.** (a) **4.** (a) **5.** (b) **6.** (a) **7.** (c) **8.** (b) **9.** (b) **10.** (a)

Chapter 10

Exercise - 10 (A)

1. (a) 748 sec (b) 900 min (c) 15 min 27 sec (d) 8 hours **2.** (a) 107 days (b) 590 days (c) 88 months (d) 28 months **3.** (a) 360 (b) 3 (c) 360 (d) 5 **4.** (a) 210 sec (b) 325 sec (c) 915 sec (d) 620

sec **5.** (a) 8 min 35 sec (b) 7 min 59 sec (c) 315 (d) 879 **6.** (a) 5 hrs 25 min 29 sec (b) 11 hrs 52 min (c) 4 hrs 7 sec (d) 13 hrs 55 min **7.** (a) 1 hr 37 min 29 sec (b) 1 hr 6 min 5 sec (c) 2 hrs 28 min 48 sec (d) 1 hr 46 min 25 sec **8.** Sheena **9.** (a) 60 months (b) 6 years 2 months (c) 7 years 5 months (d) 93 months **10.** First train **11.** (a) 16 hours (b) 3 hrs 28 min (c) 11 hrs 5 min (d) 2 hrs 1 min **12.** (a) 15 min 5 sec (b) 16 min 48 sec (c) 16 min 10 sec (d) 8 min 10 sec **13.** 4 hrs 1 min 0 sec

Exercise - 10 (B)

1. (a) 78 min 18 sec (b) 16 years 3 months (c) 14 years 8 months (d) 20 hrs 37 min **2.** (a) 7 min 41 sec (b) 12 years 7 months (c) 2 hrs 44 min (d) 6 min 38 sec **3.** 12 years **4.** 4 hrs **5.** (a) 5 hrs 30 min (b) 3 hrs 15 min (c) 8 hrs 40 min (d) 9 hrs 5 min **6.** 6 hrs 10 min 7. 17 hrs 15 min **8.** 9 hrs 30 min **9.** 22 Feb **10.** (a) 0700 hour (b) 1015 hours (c) 12 noon (d) 3:55 pm

Exercise - 10 (C)

1. (a) 25th September (b) 30th October **2.** (a) 14th January (b) 10th December (c) 26th April (d) 18th March (e) 14th December (f) 16th May **3.** 10th July **4.** 3:25 pm **5.** 9th June

Multiple Choice Questions (MCQs)

1. (b) **2.** (c) **3.** (b) **4.** (a) **5.** (a) **6.** (b)