

You have studied 'The Time' in your previous classes. The time is measured in hours, minutes and seconds. Look at the clock to know the time.



Facts to Know

- The word 'clock' comes from the French word 'cloche' meaning bell.
- 1 hour = 60 min ; 1 min = 60 seconds



Bigger Units of Time

- 1 year = 12 months or 52 weeks or 365 days
- 1 week = 7 days
- 1 day = 24 hours; 1 hour = 60 minutes; 1 minute = 60 seconds
- 1 decade = 10 years
- 1 century = 100 years
- 1 millennium = 1000 years



Conversion of Units

Converting from a bigger unit into a smaller unit.

For converting from a bigger unit into a smaller unit, we multiply.



Example I : How many minutes are there in :
 a. 5 hours? b. 2 hours 15 minutes?

Solution : a. 5 h = 5×60 min
 = 300 min





$$\begin{aligned} \text{b. } 2 \text{ h } 15 \text{ min} &= 2 \times 60 \text{ min} + 15 \text{ min} \\ &= 120 \text{ min} + 15 \text{ min} \\ &= 135 \text{ min} \end{aligned}$$

Example II : How many seconds are there in :

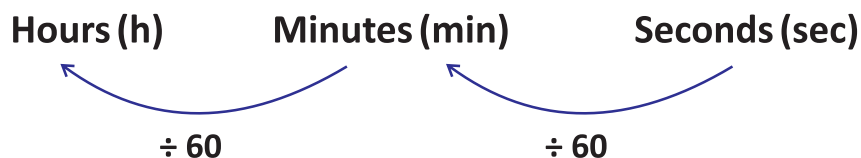
- a. 4 minutes? b. 1 minute 55 seconds?

Solution : a. $4 \text{ min} = 4 \times 60 \text{ sec}$
 $= 240 \text{ sec}$

b. $1 \text{ min } 55 \text{ seconds} = 1 \times 60 \text{ sec} + 55 \text{ sec}$
 $= 60 \text{ sec} + 55 \text{ sec}$
 $= 115 \text{ sec}$

Converting from a smaller unit into a bigger unit

For converting from a smaller unit a bigger unit, we divide.



Example III : How many hours will these make?

- a. 300 minutes b. 180 minutes

Solution : a. $300 \text{ min} = 300 \div 60 \text{ h}$ b. $180 \text{ min} = 180 \div 60 \text{ h}$

$$\begin{array}{r} 5 \rightarrow \text{hours} \\ 60 \overline{) 300} \\ \underline{- 300} \\ 0 \rightarrow \text{minutes} \end{array}$$

$$\begin{array}{r} 3 \rightarrow \text{hours} \\ 60 \overline{) 180} \\ \underline{- 180} \\ 0 \rightarrow \text{minutes} \end{array}$$

Example IV : How many minutes will these make?

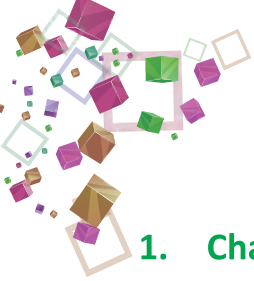
- a. 180 seconds b. 725 seconds

Solution : a. $180 \text{ sec} = 180 \div 60 \text{ min}$ b. $725 \text{ sec} = 725 \div 60 \text{ min}$

$$\begin{array}{r} 3 \rightarrow \text{minutes} \\ 60 \overline{) 180} \\ \underline{- 180} \\ 0 \rightarrow \text{seconds} \end{array}$$

$$\begin{array}{r} 12 \rightarrow \text{minutes} \\ 60 \overline{) 725} \\ \underline{- 60} \\ 125 \\ \underline{- 120} \\ 5 \rightarrow \text{seconds} \end{array}$$





Exercise 12.1

1. Change into minutes.

- a. 8 h = b. 12 h = c. 2 h 5 min =
 d. $11\frac{1}{2}$ h = e. 2 h 15 min = f. 9 h 40 min =

2. Change into seconds.

- a. 12 min = b. 13 min = c. 6 min 14 sec =
 d. $2\frac{1}{4}$ min = e. $2\frac{1}{2}$ min = f. 3 min 47 sec =

3. Change into hours and minutes.

- a. 400 min = b. 548 min = c. 380 min =
 d. 1400 min = e. 812 min = f. 680 min =


4. Change into minutes and seconds.

- a. 475 sec = b. 700 sec = c. 800 sec =
 d. 2500 sec = e. 478 sec = f. 72 sec =

5. Solve these word problems.


- a. Rina spends 180 minutes in a week in reading the magazines. How many hours is that?



- b.  The train stops for 180 seconds at a Metro station. How many minutes does it stop for?

- c. Sambhu takes 2 hours 50 minutes to finish his study. How many minutes is that?



- d.  During a television programme, there were 7 breaks of 30 seconds each. The breaks lasted for a total of minutes.



Addition and Subtraction of Time

Example V : Neeraj spends 1 hour 25 minutes in the gym in the morning and 1 hour 45 minutes in the evening. How much time does he spend in the gym every day?

Solution : Time spent in the gym every day = 1 h 25 min + 1 h 45 min





$$1\text{ h} + 1\text{ h} = 2\text{ h}$$

$$25\text{ min} + 45\text{ min} = 70\text{ min}$$

$$70\text{ min} = 1\text{ h} + 10\text{ min}$$

$$2\text{ h} + 1\text{ h} + 10\text{ min} = 3\text{ h} + 10\text{ min}$$

Neeraj spends 3 h 10 min in the gym every day.

Example VI : On Monday, Sneha dance class lasted for 2 hours 10 minutes. While on Tuesday, it lasted for 1 hour 35 minutes. How much longer was the dance on Monday?

Solution : To find how much longer the dance class was on Monday, subtract 1 h 35 min from 2 h 10 min.

$$2\text{ h } 10\text{ min} - 1\text{ h } 35\text{ min} = ?$$

$$2\text{ h } 10\text{ min} = 1\text{ h } 70\text{ min}$$

Thus, $1\text{ h } 70\text{ min} - 1\text{ h } 35\text{ min} = ?$

$$1\text{ h} - 1\text{ h} = 0\text{ h}$$

$$70\text{ min} - 35\text{ min} = 35\text{ min}$$

Not enough minutes, so we regroup 1 hour into 60 minutes.



On Monday, Sneha dance class lasted 35 minutes longer.

Alternative Method

We can add or subtract by arranging in columns.

$$\begin{array}{r}
 1\text{ h } 25\text{ min} \\
 + 1\text{ h } 45\text{ min} \\
 \hline
 2\text{ h } 70\text{ min} \\
 \begin{array}{l} \swarrow \searrow \\ 60 + 10 \\ \swarrow \\ 1\text{ h} \end{array} \\
 \hline
 3\text{ h } 10\text{ min}
 \end{array}$$

$$1\text{ h } 25\text{ min} + 1\text{ h } 45\text{ min} = 3\text{ h } 10\text{ min}$$

$$\begin{array}{r}
 \textcircled{1} \quad 60+ \\
 2\text{ h } 10\text{ min} \\
 - 1\text{ h } 35\text{ min} \\
 \hline
 1\text{ h } 70\text{ min} \\
 - 1\text{ h } 35\text{ min} \\
 \hline
 0\text{ h } 35\text{ min}
 \end{array}$$

$$2\text{ h } 10\text{ min} - 1\text{ h } 35\text{ min} = 35\text{ min}$$

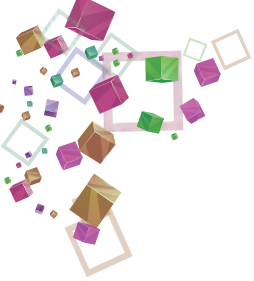
Example VII : My mother is 32 years 7 months old.

My father is 3 years 8 months older than my mother.

What is my father's age?

Solution : Father's age = 32 years 7 months + 3 years 8 months





$$\begin{array}{r}
 32 \text{ years } 7 \text{ months} \\
 + 3 \text{ years } 8 \text{ months} \\
 \hline
 35 \text{ years } 15 \text{ months} \\
 \begin{array}{l}
 \swarrow \searrow \\
 12 + 3 \\
 \swarrow \searrow \\
 1 \text{ year}
 \end{array} \\
 \hline
 36 \text{ years } 3 \text{ months}
 \end{array}$$

My father age is 36 years 3 months.

Example VIII : Avankita is 10 years 3 months old and Aryan is 8 years 7 months old. How much younger is Aryan?

Solution :

$$\begin{array}{r}
 \begin{array}{l}
 \overset{9}{\curvearrowright} \quad \overset{12+}{\curvearrowright} \\
 10 \text{ years } 3 \text{ months} \\
 - 8 \text{ years } 7 \text{ months} \\
 \hline
 9 \text{ years } 15 \text{ months} \\
 - 8 \text{ years } 7 \text{ months} \\
 \hline
 1 \text{ year } 8 \text{ months}
 \end{array}
 \end{array}$$

Aryan is 1 year 8 months younger than Avankita.



Exercise 12.2

1. Find the sum of the following.

- a. 6 years 6 months + 4 years 6 months b. 5 h 40 min + 7 h 10 min
 c. 3 h 25 min + 4 h 50 min d. 2 years 11 months + 2 years 10 months

2. Find the difference of the following.

- a. 11 years 5 months – 7 years 4 months b. 9 h 50 min – 5 h 35 min
 c. 12 h 20 min – 4 h 45 min d. 10 years 3 months – 4 years 8 months

3. Solve these word problems.

- a. A tourist bus takes 5 hours 50 minutes to reach Chandigarh to Delhi. However, on 4 March it broke down on the way and took 1 hour 30 minutes longer. What was the duration of the journey on 4 March?
- b. Mrs. Chautala tends her garden every day for 1 hours 10 minutes. Mrs. Mehra does the same for 55 minutes. How much more time does Mrs. Lal jallandhar spend in looking after her garden?
- c. Mr. Karunakaran was in Pune for 6 years 5 months. He was in jallandhar for 3 years 6 months. How much longer was Karunakaran in Pune?





Calculating the Time



Example IX : What time will this clock show after 5 hours 30 minutes?

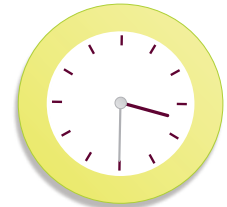
Solution : The time in the clock is 3.30 p.m.

To find the time 5 hours 30 minutes after 3.30 p.m.

Add 5 hours 30 minutes to 3 hours 30 minutes.

$$3.30 \text{ p.m.} \xrightarrow{+5 \text{ h}} 8.30 \text{ p.m.} \xrightarrow{+30 \text{ min}} 9.00 \text{ p.m.}$$

The clock will show 9.00 p.m. after 5 hours 30 minutes.



3.30 p.m.

Example X : Can you tell the time that this clock showed 5 hours 20 minutes ago?

Solution : The time in the clock is 11.30 p.m.

To find the time 5 hours 20 minutes before 11.30 p.m.

Subtract 5 hours 20 minutes from 11 hours 30 minutes.

$$11.30 \text{ p.m.} \xrightarrow{-5 \text{ h}} 6.30 \text{ p.m.} \xrightarrow{-20 \text{ min}} 6.10 \text{ p.m.}$$

The clock must have shown 6.10 p.m. 5 hours 20 minutes earlier.



11.30 p.m.



Exercise 12.3

1. What time will it be...

- a. 2 hours 15 minutes after 6.30 a.m.?
- b. 6 hours 45 minutes after 11.10 a.m.?
- c. 5 hours 5 minutes after midnight?
- d. 2 hours 30 minutes after 6.15 p.m.?

2. What time will it be...

- a. 1 hours before 6.25 a.m.?
- b. 10 hours before 6.30 p.m.?
- c. 5 hours 15 minutes before 5.00 p.m.?
- d. 3 hours 20 minutes before 9.30 a.m.?

3. Solve these word problems.

- a. The class picnic got over at 5.00 p.m. If it lasted for 6 hours 30 minutes, at what time did it began?
- b. The Independence Day celebrations in the school got over at 10 a.m. If the programme was for 2 hour, at what time did it begin?
- c. Manish started his homework at 6.55 p.m. and finished it 1 hour 5 minutes later. At what time did he finish his homework?





Calculating the Date

Example XI : Bakshi started preparing for his exams on 17 July.
The exams were to start 25 days later. On which date were the exams scheduled to begin?

Solution : Starting date of preparation = 17 July
Preparation time = 25 days
Date on which the exams begin = ?

We can find the finishing date by **counting forward**.

17 July to 31 July = $31 - 16 = 15$ days
Days left after the month of July = $25 - 15 = 10$
Bakshi exams will begin on 10 August.

Example XII : Radha's dance classes got over on 7 July after 39 days.
When did they begin?

Solution : Finishing date = 7 July
Duration = 39 days
Starting date = ?

We can find the starting date by **counting backwards**.

7 July to 1 July = 7 days
Days left before the month of July = $39 - 7 = 32$ days
30 June to 1 June = 30 days
Days left before the month of June = $32 - 30 = 2$ days
2 days of May = 31 and 30

The dance classes began on 30 May.



Exercise 12.4

1. Complete the table.

	Starting Date	Duration	Finishing Date
a.	23 January	26 days	
b.	16 March	40 days	
c.	8 June	45 days	
d.		20 days	19 November
e.		15 days	5 January





2. Solve these word problems.

- Lucy went to the London on 22 July for 25 days. On which date did she leave the London?
- The students of Class V had their Sports Day on 5 February. If they started practising 35 days earlier, on which date did the practice begin?
- Mohini started knitting a muffler for her mother on Republic day. It took her 17 days to complete it. When did she finish it?



Temperature

Temperature is the measure of hotness or coldness of a body, object or substance. The thermometer is an instrument used to measure temperature.

Measuring Temperature

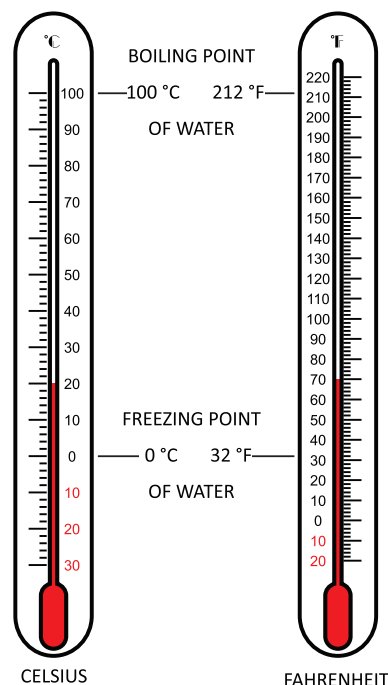
Thermometer can have scales in degree Fahrenheit ($^{\circ}\text{F}$) and in degree Celsius ($^{\circ}\text{C}$). Celsius scale is also called Centigrade scale and is marked from 0° to 100° .

0° shows the freezing point of water and 100° shows the boiling point of water.

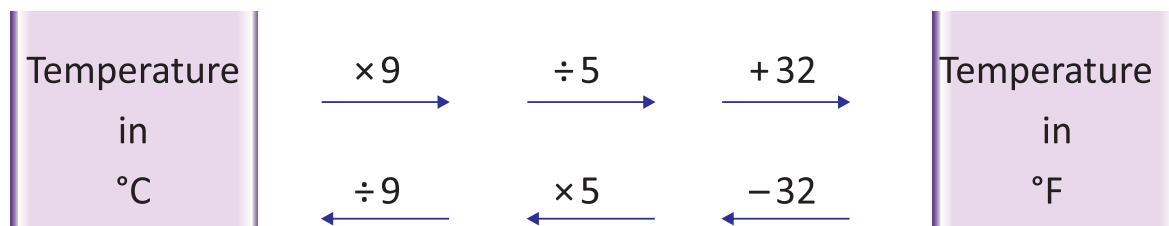
The Fahrenheit scale is marked from 32° to 212° where 32°F shows the freezing point of water and 212°F shows the boiling of water.

On comparing the Celsius and Fahrenheit scales we find :

	$^{\circ}\text{C}$	$^{\circ}\text{F}$
Water freezes at	0°	32°
Water boils at	100°	212°
Normal body temperature	37°	98.6°



Conversion





From Celsius to Fahrenheit

Example XIII : Convert 40°C to the Fahrenheit scale.

Solution :

Step 1 : Multiply the number of degree by 9 $\rightarrow 40^{\circ} \times 9 = 360^{\circ}$.

Step 2 : Divide the product by 5 $\rightarrow 360^{\circ} \div 5 = 72^{\circ}$.

Step 3 : Add 32 to the result $\rightarrow 72 + 32 = 104^{\circ}\text{F}$ $\therefore 40^{\circ}\text{C} = 104^{\circ}\text{F}$.

From Fahrenheit to Celsius

Example XIV : Convert 104°F to the Celsius scale.

Solution :

Step 1 : Subtract 32 $\rightarrow 104^{\circ} - 32 = 72^{\circ}$.

Step 2 : Multiply the result by 5 $\rightarrow 72^{\circ} \times 5 = 360^{\circ}$.

Step 3 : Divide the product by 9 $\rightarrow 360^{\circ} \div 9 = 40^{\circ}\text{C}$. $\therefore 104^{\circ}\text{F} = 40^{\circ}\text{C}$



Clinical Thermometer

A thermometer used for measuring the temperature of human body is called a clinical thermometer. It is marked in degree Centigrade or degree Fahrenheit.

The temperature of a healthy human body is approximately 98.6°F . A person has to hold the tip of the thermometer either under the armpit or in the mouth under his tongue for a minute. Then, the number against the point at which the mercury column stops rising further indicates the body temperatures of the person.



Facts to Know

- If a human body temperature is above 98.6°F , it means he/she is suffering from fever.

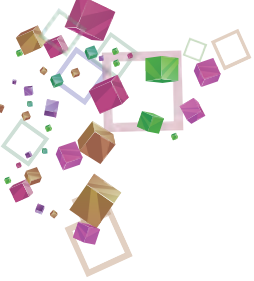


Exercise 12.5

1. Fill in the blanks

- When the temperature was 41°C , I had to wear cotton cloth to protect my self.
- What happens when temperature falls in winter?
- Water boils at $^{\circ}\text{C}$ and freezes at $^{\circ}\text{F}$.
- I can take bath at room temperature at $70^{\circ}\text{C} / 70^{\circ}\text{F}$.





EXERCISE

1. Multiple Choice Questions (MCQs)

Tick (✓) the correct option:

- a. The units of time is
- (i) hour (ii) minute (iii) second (iv) all of these
- b. Boiling point of water on the Fahrenheit scale is
- (i) 100°F (ii) 32°F (iii) 212°F (iv) 112°F
- c. 158°F is $^{\circ}\text{C}$.
- (i) 70 (ii) 80 (iii) 85 (iv) 75
- d. 50°C is $^{\circ}\text{F}$.
- (i) 150 (ii) 140 (iii) 122 (iv) 132
- e. Instrument used to measure temperature is
- (i) stethoscope (ii) thermometer
- (iii) protractor (iv) none of these

2. Change into hours and minutes.

- a. 100 min b. 225 min c. 400 min d. 330 min
- e. 550 min f. 160 min g. 245 min h. 375 min

3. Change into minutes and seconds.

- a. 80 sec b. 250 sec c. 190 sec d. 460 sec
- e. 670 sec f. 345 sec g. 580 sec h. 220 sec

4. Find the sum of the following.

- a. 5 h 45 min and 8 h 55 min b. 7 h 20 min and 9 h 30 min
- c. 3 h 30 min and 5 h 40 min d. 8 h 25 min and 10 h 45 min

5. Find the difference of the following.

- a. 9 h 50 min – 7 h 30 min b. 8 h 10 min – 3 h 40 min
- c. 7 h 20 min – 4 h 50 min d. 9 h 30 min – 5 h 55 min

6. Change the following temperature into Fahrenheit scale.

- a. 60°C b. 80°C c. 100°C d. 120°C
- e. 50°C f. 35°C g. 20°C h. 150°C





7. Change the following temperatures into Celsius scale.

- a. 194 °F b. 95 °F c. 50 °F d. 104 °F
- e. 257 °F f. 122 °F g. 32 °F h. 167 °F

8. A bus takes 5 h 30 min for going from Delhi to Haridwar. In returning, it takes 6 h 45 min. How much total time is taken by the bus?

9. Sandeep’s office time is 9.00 a.m. to 5.30 p.m. There are two tea breaks of 30 minutes and a lunch break for 45 minutes. How much time he works in the office?



HOTS

Suzi and Samuel celebrate their birthdays on consecutive days, but in year 2012, they celebrated their birthdays with one day in between. Guess the dates on which they were born?



Lab Activity

Objective

: Discovering patterns in days of a month.

Materials Required

: Old calendars — 1 calendar for each student, paper and pencil

Activities:

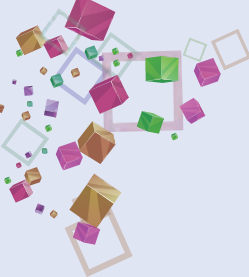
- ❖ Choose any month of the year. Mark four dates as shown. Add both pairs of diagonal dates. What do you discover? Try some more dates in the same manner.
- ❖ Choose another month. Add two adjacent pairs of dates that are one below the other. What is the difference of the two sums? Try some more in the same manner.
- ❖ Choose another month. Cross multiply two pairs of numbers. What is the difference of the two products? Try some more of the same kind.

S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

S	M	T	W	Th	F	S
30	31					1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31





REVISION TEST PAPER-III

(Based on Chapters 9 to 12)

A. Multiple Choice Questions (MCQs)

Tick (✓) the correct option:

- The amount of space enclosed by a solid figure is
 (a) area (b) perimeter
 (c) dimension (d) volume
- A 3-D figure in which length = breadth = height is
 (a) cube (b) cone (c) sphere (d) cuboid
- The sides of a square are
 (a) equal (b) unequal
 (c) standard (d) none of these
- In Fahrenheit scale, the freezing point of water is
 (a) 0°F (b) 212°F (c) 32°F (d) none of these
- How many hours are there in a day?
 (a) 12 (b) 24 (c) 15 (d) none of these
- 60 seconds make a/an
 (a) hour (b) day (c) minute (d) none of these
- Celsius scale is divided into
 (a) 180 parts (b) 100 parts
 (c) 2012 parts (d) none of these
- The area of a figure is measured in
 (a) cu unit (b) unit
 (c) Sq unit (d) none of these
- Number of parts in which Celsius scale is divided
 (a) 180 (b) 100 (c) 200 (d) 300
- The volume of cube whose edge is 6 cm is
 (a) 36 cm^3 (b) 216 cm^3
 (c) 60 cm^3 (d) 80 cm^3

B. Match the columns:

Column A

- Furlong
- Perimeter
- Volume
- 480 minutes
- 0°C

Column B

- boundary
- length
- 8 hours
- 32°F
- length \times breadth \times height

