

RD Sharma Class 7 Solutions chapter-20 Mensuration-I Exercise-20.1

Exercise-20.1.

Solution 1:-

(i) we have,

$$\text{Length} = 5.5 \text{ m and, Breadth} = 2.4 \text{ m}$$

WKT,

$$\text{Area of a rectangle} = \text{Length} \times \text{Breadth.}$$

$$\begin{aligned}\therefore \text{Area of a rectangle} &= 5.5 \text{ m} \times 2.4 \text{ m} \\ &= 13.2 \text{ m}^2\end{aligned}$$

(ii) we have,

$$\text{Length} = 180 \text{ cm, Breadth} = 150 \text{ cm}$$

$$\text{we know that, } 1 \text{ m} = 100 \text{ cm} \Rightarrow 1 \text{ cm} = \frac{1}{100} \text{ m}$$

$$\text{Length} = 180 \text{ cm} = 180 \times \frac{1}{100} \text{ m} = 1.8 \text{ m}$$

$$\text{Breadth} = 150 \text{ cm} = 150 \times \frac{1}{100} \text{ m} = 1.5 \text{ m}$$

$$\begin{aligned}\therefore \text{Area of a rectangle} &= \text{Length} \times \text{Breadth} \\ &= 1.8 \text{ m} \times 1.5 \text{ m} \\ &= 2.7 \text{ m}^2\end{aligned}$$

$$\therefore \text{Area of a rectangle} = 2.7 \text{ m}^2$$

Solution-2 :-

(i) we have,

$$\text{side of the square} = 2.6 \text{ cm}$$

$$\text{we know that, Area of a square} = \text{side} \times \text{side} = (\text{side})^2$$

$$\begin{aligned}\therefore \text{Area of the square} &= 2.6 \text{ cm} \times 2.6 \text{ cm} \\ &= 6.76 \text{ cm}^2\end{aligned}$$

$$\text{Area of the square} = 6.76 \text{ cm}^2$$

(ii) we have,

$$\text{side of the square} = 1.2 \text{ dm}$$

$$\text{we know that, } 1 \text{ dm} = 10 \text{ cm} \quad [\text{dm} \rightarrow \text{decimeter}]$$

$$\therefore \text{Area of the square} = (\text{side})^2$$

$$\begin{aligned}\text{side of the square} &= 1.2 \text{ dm} = 1.2 \times 10 \text{ cm} \\ &= 12 \text{ cm}\end{aligned}$$

$$\begin{aligned}\therefore \text{Area of the square} &= 12 \text{ cm} \times 12 \text{ cm} \\ &= 144 \text{ cm}^2\end{aligned}$$

Solution-5:-

(i) we have,

$$\text{Length} = 125\text{m}, \text{Breadth} = 400\text{m}.$$

Area of a rectangular field in hectares = ?

we know that,

$$1 \text{ hectare} = 10^4 \text{ m}^2 = 10,000 \text{ m}^2.$$

$$\begin{aligned} \therefore \text{Area of a rectangular field} &= \text{Length} \times \text{Breadth} \\ &= 125\text{m} \times 400\text{m} \\ &= 50,000 \text{ m}^2 \end{aligned}$$

$$1 \text{ m}^2 = \frac{1}{10,000} \text{ hectares}.$$

$$\therefore \text{Area of a rectangular field} = \frac{50,000 \times 1}{10,000} \text{ hectares}.$$

$$\therefore \text{Area of a rectangular field} = 5 \text{ hectares}.$$

$$\begin{aligned} \text{(ii) we have, Length} &= 75\text{m} 5\text{dm} = 75\text{m} + 5 \times 10\text{cm} \\ &= 75\text{m} + 50\text{cm} = 75\text{m} + \frac{50}{100}\text{m} \\ &= 75.5\text{m} \end{aligned}$$

$$\text{Breadth} = 120\text{m}.$$

$$\begin{aligned} \therefore \text{Area of a rectangular field} &= \text{Length} \times \text{Breadth} \\ &= 75.5\text{m} \times 120\text{m} \\ &= 9060 \text{ m}^2 \end{aligned}$$

$$\text{we know that, } 1 \text{ m}^2 = \frac{1}{10,000} \text{ hectares}.$$

$$\therefore \text{Area of a rectangular field} = \frac{9060}{10,000} \text{ hectares}$$

$$\therefore \text{Area of a rectangular field} = 0.906 \text{ hectares}.$$

Solution-06:-

Given that,

Door of length = 3m and Breadth = 2m.

Wall of Length = 10m and Breadth = 10m.

$$\begin{aligned} \text{Area of Door} &= \text{Length} \times \text{Breadth of door} \\ &= 3\text{m} \times 2\text{m} = 6 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Wall} &= \text{Length of Wall} \times \text{Breadth of Wall} \\ &= 10\text{m} \times 10\text{m} = 100 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of Painting Wall} &= \text{Area of Wall} - \text{Area of Door} \\ &= 100 \text{ m}^2 - 6 \text{ m}^2 = 94 \text{ m}^2. \end{aligned}$$

$$\text{Cost of Painting Wall} = 94 \times \text{Rs } 2.50$$

$$[\because \text{Cost per sq.m}^2 \text{ painting} = \text{Rs } 2.50]$$

$$\therefore \text{cost of Painting Wall} = 94 \times 2.50 = \text{Rs } 235$$

Solution-07:-

It is given that,

Rectangular Shaped Wire of Length = 40cm and
Breadth = 22cm.

Given that Perimeter of Rectangle = Perimeter of Square.

[∵ A wire in the shape of Rectangle is bent in square shape].

$$\Rightarrow 2(l+b) = 4(\text{side})$$

$$\Rightarrow 2(40+22) = 4(\text{side}) \Rightarrow 124\text{cm} = 4(\text{side})$$

$$\Rightarrow \text{side} = 31\text{cm}.$$

$$\text{Area of Square} = (31)^2 = 961\text{cm}^2 \quad [\because A = (\text{side})^2]$$

$$\text{Area of Rectangle} = 40 \times 22 = 880\text{cm}^2 \quad [\because A = l \times b]$$

∴ Square Encloses More area.

Solution-08:-

It is given that,

Window, Pane of dimensions Length = 25cm.
Breadth = 16cm.

$$\therefore \text{Area of Pane} = \text{pane Length} \times \text{pane Breadth}$$

$$= 25\text{cm} \times 16\text{cm}$$

$$= 400\text{cm}^2$$

$$= 0.04\text{m}^2$$

$$= \frac{400}{10,000}\text{m}^2 \quad \left[1\text{cm}^2 = \frac{1}{10,000}\text{m}^2\right]$$

$$= 0.04\text{m}^2$$

$$\therefore \text{Area of Window} = 12 \times \text{Each pane Area}$$

$$= 12 \times 0.04\text{m}^2 = 0.48\text{m}^2$$

$$\therefore \text{glass will be required for a window} = 0.48\text{m}^2$$

Solution-09:-

It is given that,

Marble Length = 10cm and Breadth = 12cm.

Wall of Length = 3m and Breadth = 4m.

$$\therefore \text{Area of Marble tile} = \text{Length of tile} \times \text{Breadth of tile}$$

$$= 10\text{cm} \times 12\text{cm} = 120\text{cm}^2$$

$$= 0.012\text{m}^2 \quad \left[\because \text{cm}^2 = \frac{1}{10,000}\text{m}^2\right]$$

$$\therefore \text{Area of Wall} = 3\text{m} \times 4\text{m} = 12\text{m}^2$$

$$\therefore \text{No. of tiles required} = \frac{\text{Area of Wall}}{\text{Area of Marble tile}} = \frac{12}{0.012}$$

$$= 1000 \text{ tiles}$$

$$\text{Total cost of the tiles for covering of wall} = 1000 \times 2\text{Rs} = \text{Rs} 2,000$$

Solution-10:-

Given that,

$$\text{Table Top} = 9\text{ dm } 5\text{ cm} = 9 \times 10\text{ cm} + 5\text{ cm} = 95\text{ cm}.$$

$$\text{Table Long} = 6\text{ dm } 5\text{ cm} = 6 \times 10\text{ cm} + 5\text{ cm} = 65\text{ cm}.$$

$$\begin{aligned}\text{Area of Table} &= \text{Table Top} \times \text{Table Long} \\ &= 95\text{ cm} \times 65\text{ cm} \\ &= 6175\text{ cm}^2.\end{aligned}$$

$$\text{Cost to polish Table} = 6175 \times 20 \text{ paise}$$

$$[\because \text{cost per } 82\text{ cm Polish} = 20 \text{ paise}]$$

$$\begin{aligned}\therefore \text{cost to polish Table} &= 6175 \times 20 \text{ paise} \\ &= \text{RS. } 1235.\end{aligned}$$

$$[\because 1\text{ RS} = 100 \text{ paise}]$$

Solution-11:-

It is Given that,

$$\text{Room Length} = 9.68\text{ m and Breadth (wide)} = 6.2\text{ m}.$$

$$\text{Rectangular tile of Length} = 22\text{ cm}.$$

$$\text{Breadth} = 10\text{ cm}.$$

$$\text{Cost per tile} = \text{Rs } 2.50.$$

$$\text{Area of Room} = 9.68 \times 6.2 \text{ m}^2 = 60.016 \text{ m}^2$$

$$\begin{aligned}\text{Area of Rectangular tile} &= 22\text{ cm} \times 10\text{ cm} = 220\text{ cm}^2 \\ &= 0.022 \text{ m}^2\end{aligned}$$

$$\begin{aligned}\text{No. of tiles} &= \frac{\text{Area of Room}}{\text{Area of Rectangular tile}} = \frac{60.016 \text{ m}^2}{0.022 \text{ m}^2} \\ &= 2728 \text{ tiles}.\end{aligned}$$

$$\therefore \text{Cost of the tiles} = 2728 \times \text{Rs } 2.50 = \text{Rs } 6820$$

Solution-12:-

Given square field of side = 179 m.

$$\begin{aligned}\text{Area of square field} &= 179 \text{ m} \times 179 \text{ m} \\ &= 32041 \text{ m}^2\end{aligned}$$

Cost of Raising a Lawn on the field =

$$\text{Rs } 1.50 \text{ per sq. m.}$$

$$\text{Total cost of Raising of a Lawn on the field} = 32041 \times 1.5$$

$$= \text{Rs } 48,061.50 \text{ Paise}.$$

$$\therefore \text{Total cost} = \text{Rs } 48,061.50.$$

Solution-14:-

Given that,

$$\text{Corridor of a school Length} = 8\text{ m}.$$

$$\text{Breadth} = 6\text{ m}.$$

$$\text{Canvas sheet Length} = 2\text{ m}.$$

$$\text{Breadth} = 1\text{ m}.$$

$$\begin{aligned}\text{Area of a corridor} &= L \times B = 8\text{ m} \times 6\text{ m} \\ &= 48 \text{ m}^2.\end{aligned}$$

$$\text{Canvas sheet Area} = 2\text{ m} \times 1\text{ m} = 2 \text{ m}^2.$$

$$\begin{aligned}\text{No of sheets} &= \frac{\text{Area of corridor}}{\text{Canvas sheet Area}} = \frac{48 \text{ m}^2}{2 \text{ m}^2} \\ &= 24.\end{aligned}$$

Cost of the canvas sheets req. to cover the

$$\text{corridor} = 24 \times \text{Rs. } 8 = \text{Rs. } 192.$$

Solution-15:-

given
 Play ground Length = $62\text{m } 60\text{cm} = 62 + \frac{60 \times 1}{100} \text{ m}$
 $= 62.6 \text{ m}$
 Breadth = $25\text{m } 40\text{cm} = 25 + \frac{40}{100} \text{ m}$
 $= 25.4 \text{ m}$

Area of a play ground = $62.6 \times 25.4 = 1590.04 \text{ m}^2$

cost of turfing = $1590.04 \times 2.5 = \text{Rs } 3975$.

perimeter of a play ground = $2(62.6 + 25.4) = 176 \text{ m}$.

Perimeter of 3 times round the field = $3 \times 176 \text{ m} = 528 \text{ m}$
 And he walks 2 m/sec .

Time = $\frac{528}{2} = 264 \text{ seconds} = 4 \text{ min } 24 \text{ seconds}$.

Solution-16:-

Lane length = 180 m and Breadth = 5 m .

Bricks of Length = 20 cm and Breadth = 15 cm .

Area of a Lane = $180 \text{ m} \times 5 \text{ m} = 900 \text{ m}^2$

Area of a Brick = $20 \text{ cm} \times 15 \text{ cm} = 300 \text{ cm}^2$

$= \frac{300}{10,000} \text{ m}^2 = 0.03 \text{ m}^2$

No. of Bricks = $\frac{\text{Area of Lane}}{\text{Area of Brick}} = \frac{900}{0.03}$

$= 30,000$.

Total cost of Bricks = $30 \times \text{Rs } 750$

$= \text{Rs } 22,500$ [∵ cost per
1000 bricks
 $= \text{Rs } 750$].

Solution-17:-

sheet of Paper Length = 125 cm & Breadth = 85 cm .

piece of Paper of size Length = 17 cm & Breadth = 5 cm

sheet of Paper Area = $125 \text{ cm} \times 85 \text{ cm}$.

Piece of Paper Area = $17 \text{ cm} \times 5 \text{ cm}$.

No. of envelopes = $\frac{\text{Sheet of Paper Area}}{\text{Piece of Paper Area}}$

$= \frac{125 \text{ cm} \times 85 \text{ cm}}{17 \text{ cm} \times 5 \text{ cm}} = 125 \text{ cm}$.

∴ 125 cm of envelopes can be made out of a sheet.

Solution-18:-

The width of a cloth = 170 cm .

Length of a cloth = $2 = 1$

No. of diapers = 25 .

Piece of cloth Length = 50 cm and

Breadth = 17 cm .

No. of diapers = $\frac{\text{Area of a cloth}}{\text{Area of a piece of cloth}}$

$25 = \frac{170 \text{ cm} \times 1}{50 \text{ cm} \times 17 \text{ cm}}$

$\frac{25 \times 50 \text{ cm}}{10} = 1 \Rightarrow 1 = 125 \text{ cm}$.

Solution 21:-

Given dimensions of a hall

$$\text{length} = 36 \text{ m} = 'l'$$

$$\text{breadth} = 24 \text{ m} = 'b'$$

And also given area of doors and windows = 80 m^2

Let h be the height of the hall.

Area of papering the wall

$$= 2lh + 2bh - \{\text{Area of windows and doors}\}$$

$$= (36 \times h + 36 \times h + 24 \times h + 24 \times h - 80) \text{ m}^2$$

$$= 2 \times h \times (36 + 24) - 80$$

$$= (120h - 80) \text{ m}^2$$

$$\therefore \text{Total area of papering} = (120h - 80) \text{ m}^2.$$

We have

$$\text{Cost of papering the walls per } 1 \text{ m}^2 = \text{Rs } 8.40$$

$$\text{Cost of papering the walls} = \text{Rs } 9408.$$

from this, we get

$$\text{Total area of papering (in } \text{m}^2) = \frac{\text{Rs } 9408}{\text{Rs } 8.40}$$

$$= 1120 \text{ m}^2$$

$$\text{But we have, Total area} = (120h - 80) \text{ m}^2$$

$$\therefore 120h - 80 = 1120$$

$$120h = 1200$$

$$\Rightarrow h = \frac{1200}{120} = 10 \text{ m}$$

$$\therefore \text{Height of the hall} = 10 \text{ m}.$$

chapter-20 Mensuration-I

Exercise-20.2

Exercise-20.2.

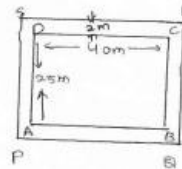
Solution-01:-

Let ABCD be the Grassy Lawn, and Let PQRS be the external boundaries of the path, we have,

Length of AB = 40m.

Breadth of BC = 25m.

$$\begin{aligned} \text{Area of Lawn ABCD} &= 40 \times 25 \text{ m}^2 \\ &= 1000 \text{ m}^2 \end{aligned}$$



Length of PQ = $(40 + 2 + 2)$ m

Breadth of QR = $(25 + 2 + 2)$ m

$$\begin{aligned} \therefore \text{Area of PQRS} &= 44 \times 29 \text{ m}^2 \\ &= 1276 \text{ m}^2 \end{aligned}$$

Now,

Area of the path

$$= \text{Area of PQRS} - \text{Area of Lawn}$$

$$= (1276 - 1000) \text{ m}^2$$

$$= 276 \text{ m}^2$$

$$\begin{aligned} \text{Cost of levelling the path} &= 276 \times \text{RS } 825 \\ &= \text{RS } 2277 \end{aligned}$$

Solution-02:-

Let ABCD be the Square Park and Let PQRS be the internal boundaries of the path.

we have,

Length AB = 30m = side AB

$$\begin{aligned} \text{Length PQ} &= 30\text{m} - 2\text{m} \\ &= 28\text{m} = \text{side PQ} \end{aligned}$$

$$\begin{aligned} \text{Area of ABCD} &= 30\text{m} \times 30\text{m} \\ &= 900 \text{ m}^2 \end{aligned}$$

$$\begin{aligned} \text{Area of PQRS} &= 28\text{m} \times 28\text{m} \\ &= 784 \text{ m}^2 \end{aligned}$$

$$\text{Total cost} = \text{RS } 1176$$

$$\text{Cost Per sq.m} = \frac{\text{RS } 1176}{\text{Area}}$$

$$= \frac{\text{RS } 1176}{784}$$

$$= \text{RS } 1.5 \text{ per sq.m.}$$

Solution-04:-

Rectangular sheet

$$\text{Length} = 100 \text{ cm}$$

$$\text{Breadth} = 80 \text{ cm}$$

$$\begin{aligned}\text{Area} &= 100 \times 80 \text{ cm}^2 \\ &= 8000 \text{ cm}^2\end{aligned}$$

Square of side = 10 cm

$$\begin{aligned}\text{Area of Square} &= 10 \times 10 \text{ cm}^2 \\ &= 100 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{Area of 4 squares} &= 4 \times 100 \text{ cm}^2 \\ &= 400 \text{ cm}^2\end{aligned}$$

$$\begin{aligned}\text{Area of Remaining sheet} &= \text{Area of rect} - 4 \times \text{Area of sq} \\ &= 8000 \text{ cm}^2 - 400 \text{ cm}^2 = 7600 \text{ cm}^2\end{aligned}$$