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

Exercise - 20.1.

Solution 1:-

(i) we have,

Length = 5.5m and, Breadth = 2.4m

WKT,

Area of a rectangle = Length x Breadth.

∴ Area of a rectangle = 5.5m x 2.4m

= 13.2 m^2

(ii) we have.

Length = 180cm, Breadth = 150cm

we know that, 1m = 100cm. ⇒ 1cm = $\frac{1}{100}$ m

Length = 180 cm = 180 x $\frac{1}{100}$ m = 1.8m.

Breadth = 150cm = 150 x $\frac{1}{100}$ m = 1.5m.

∴ Area of a rectangle = Length x Breadth

= 1.8m x 1.5m

= 2.7 m^2

∴ Area of a rectangle = 2.7 m^2.

Solution - 2 :-

i) we have.

side of the Square = 2.6 cm.

we know that, Area of a square = side x side = $(side)^2$

∴ Area of the Square = 2.6cm x 2.6 cm.

= 6.76 cm^2

Area of the Square = 6.76 cm^2.

(ii) we have.

side of the Square = 1.2dm.

we know that, 1dm = 10cm [dm → decimeter]

∴ Area of the Square = $(side)^2$

Side of the Square = 1.2 dm = 1.2 x 10 cm

= 12 cm

∴ Area of the Square = 12cm x 12cm

= 144 cm^2.

Solution-5 :-

(i) we have.

Length = 125m, Breadth = 400m.

Area of a rectangular field in hectares = ?.

we know that,

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

∴ Area of a rectangular field = Length × Breadth

$= 125m \times 400m$

$= 50,000 m^2$

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

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

∴ Area of a retangular field = 5 hectares.

(ii) we have, Length = 75m 5dm = 75m + 5 × 10cm.

$= 75m + 50cm = 75m + \frac{50}{100}m$

$= 75.5m$.

Breadth = 120m.

∴ Area of a rectangular field = Length × Breadth

$= 75.5m \times 120m$.

$= 9060 m^2$

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

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

∴ Area of a rectangular field = 0.906 hectares.

Solution-06 :-

Given that,

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

Wall of Length = 10m and Breadth = 10m

Area of Door = Length × Breadth of door

$= 3m \times 2m = 6 m^2$

Area of Wall = Length of Wall × Breadth of Wall

$= 10m \times 10m = 100 m^2$

Area of painting Wall = Area of Wall - Area of Door

$= 100 m^2 - 6 m^2 = 94 m^2$.

Cost of Painting Wall = 94 × Rs 2.50

[∵ Cost per $1 m^2$ painting = Rs 2.50]

∴ cost of Painting Wall = 94 × 2.50 = 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 is in the shape of Rectangle is bent in square Shape].

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

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

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

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

Area of Rectangle $= 40 \times 22 = 880\,cm^2$ $[\because A = l \times b]$.

$\therefore$ Square encloses more area.

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solution-08:-

It is given that.

Window, Pane of dimensions Length = 25cm

Breadth = 16cm.

$\therefore$ Area of Pane = Pane Length x Pane Breadth

$= 25\,cm \times 16\,cm$

$= 400\,cm^2$

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

$= 0.04\,m^2$.

$\therefore$ Area of Window = 12 x Each Pane Area

$= 12 \times 0.04\,m^2 = 0.48\,m^2$

$\therefore$ glass will be required for a window $= 0.48\,m^2$

Solution-09:-

It is given that,

Marble Length = 10cm and Breadth = 12cm.

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

$\therefore$ Area of Marble tile = Length of tile x Breadth of tile

$= 10\,cm \times 12\,cm = 120\,cm^2$

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

$\therefore$ Area of Wall $= 3m \times 4m = 12\,m^2$

$\therefore$ No of tiles required $= \frac{\text{Area of Wall}}{\text{Area of Marble tile}} = \frac{12}{0.012} = 1000$ tiles

Total cost of the tiles for covering of Wall $= 1000 \times 2\,Rs = Rs\,2,000/-$

Solution-10:-

Given that.

Table top = 9dm 5cm = 9x10cm + 5cm = 95cm.

Table Long = 6dm 5cm = 6x10cm + 5cm = 65cm.

Area of Table = Table Top x Table Long

= 95cm x 65cm.

= 6175 cm^2

Cost to polish Table = 6175 x 20 paise

[∵ cost per Sq.cm polish = 20paise]

∴ cost to polish Table = 6175 x 20 paise

= Rs.1235.

[∵ 1Rs = 100 paise]

Solution-11:-

It is Given that,

Room Length = 9.68m and Breadth (wide) = 6.2m.

Rectangular tile of Length = 22cm.

Breadth = 10cm.

Cost per tile = Rs 2.50.

Area of Room = 9.68 x 6.2 m^2 = 60.016 m^2

Area of Rectangular tile = 22cm x 10cm = 220 cm^2.

= 0.022 m^2

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

= 2728 tiles.

∴ Cost of the tiles = 2728 x Rs 2.50 = Rs 6820

Solution-12:-

Given Square field of side = 179m.

Area of square field = 179 m x 179 m.

= 32041 m^2

Cost of Raising a Lawn on the field =

Rs 1.50 per Sq.m.

Total cost of Raising of a Lawn on the field = 32041 x 1.5

= Rs 48,061.50 Paise.

∴ Total cost = Rs 48,061.50.

Solution-14:-

Given that,

corridor of a school Length = 8m.

Breadth = 6 m.

Canvas sheet Length = 2m.

Breadth = 1m.

Area of a corridor = L x B = 8m x 6m

= 48 m^2.

Canvas sheet Area = 2m x 1m = 2 m^2.

No of sheets = $\frac{\text{Area of corridor}}{\text{Canvas sheet Area}} = \frac{48\ m^2}{2\ m^2}$

= 24

Cost of the canvas sheets req. to cover the

coridor = 24 x Rs.8 = Rs.192.

Solution-15:-

given Play ground Length = 62m 60cm = $62 + \frac{60 \times 1}{100}$ m

$= 62.6$ m.

Breadth = 25m 40cm $= 25 + \frac{40}{100}$ m

$= 25.4$ m.

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

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

Perimeter of a play ground = $2(62.6 + 25.4) = 176$ m.

Perimeter of 3 times round the field $= 3 \times 176m = 528m$

And he walks 2m/sec.

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

Solution-16:-

Lane length = 180m and Breadth = 5m.

Bricks of Length = 20cm and Breadth = 15cm

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

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

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

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

$= 30,000$.

Total cost of Bricks = $30 \times$ Rs 750

= Rs 22,500 [∵ cost per 1000 bricks = Rs 750].

Solution-17:-

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

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

sheet of paper Area $= 125cm \times 85cm$.

piece of Paper Area $= 17cm \times 5cm$

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

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

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

Solution-18:-

The width of a cloth = 170cm.

Length of a cloth = ? = l

No of diapers = 25.

Piece of cloth Length = 50cm and

Breadth = 17cm.

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

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

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

Solution 21 :-

Given dimensions of a hall

length = 36 m = l

breadth = 24m = b

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

Let h m be the height of the hall.

Area of papering the hall

$= lxh + lxh + bxh + bxh - \{$area of windows and doors$\}$

$= (36xh + 36xh + 24xh + 24xh - 80)m^2$

$= 2xh(36+24) - 80$

$= (120h - 80)m^2$

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

We have

Cost of papering ~~the walls~~ per $1 m^2$ = Rs 8.40

Cost of papering the walls = Rs. 9408.

from this, we get

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

$= 1120\ m^2$

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

$\therefore 120h - 80 = 1120$

$120h = 1200$

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

$\therefore$ Height of the hall = 10m.

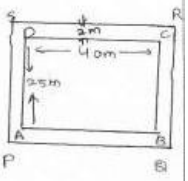
chapter-20 Mensuration-I
Exercise-20.2

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.

Area of Lawn ABCD = $40 \times 25 m^2$

$= 1000\ m^2$

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

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

∴ Area of PQRS = $44 \times 29 m^2$

$= 1276 m^2$

Now,

Area of the path

= Area of PQRS - Area of Lawn

= $(1276 - 1000) m^2$

= $276 m^2$

Cost of levelling the path = 276 × RS 8.25

= RS 2277

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

Length PQ = 30m - 2m

= 28m = side PQ

Area of ABCD = 30m × 30m

$= 900 m^2$

Area of PQRS = 28m × 28m

$= 784 m^2$

Total cost = Rs 1176.

Cost per sq.m = $\frac{\text{Rs } 1176}{\text{Area}}$

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

= Rs. 1.5 per sq.m.

Solution-04:-

Rectangular sheet

Length = 100 cm

Breadth = 80 cm

Area = $100 \times 80 cm^2$

= $8000 cm^2$

Square of side = 10 cm

Area of Square = $10 \times 10 cm^2$

= $100 cm^2$

Area of 4 squares = $4 \times 100 cm^2$

= $400 cm^2$

Area of Remaining sheet = Area of rect - 4 x Area of Sq

= $8000 cm^2 - 400 cm^2 = 7600 cm^2$