

Exercises – 20 A

Q. 1

Answer :

(i) Length = 24.5 m
Breadth = 18 m

$$\begin{aligned}\therefore \text{Area of the rectangle} &= \text{Length} \times \text{Breadth} \\ &= 24.5 \text{ m} \times 18 \text{ m} \\ &= 441 \text{ m}^2\end{aligned}$$

(ii) Length = 12.5 m
Breadth = 8 dm = $(8 \times 10) = 80 \text{ cm} = 0.8 \text{ m}$ [since 1 dm = 10 cm and 1 m = 100 cm]

$$\begin{aligned}\therefore \text{Area of the rectangle} &= \text{Length} \times \text{Breadth} \\ &= 12.5 \text{ m} \times 0.8 \text{ m} \\ &= 10 \text{ m}^2\end{aligned}$$

Q. 2

Answer :

We know that all the angles of a rectangle are 90° and the diagonal divides the rectangle into two right angled triangles.

So, 48 m will be one side of the triangle and the diagonal, which is 50 m, will be the hypotenuse.

According to the Pythagoras theorem:

$$(\text{Hypotenuse})^2 = (\text{Base})^2 + (\text{Perpendicular})^2$$

$$\text{Perpendicular} = \sqrt{(\text{Hypotenuse})^2 - (\text{Base})^2}$$

$$\text{Perpendicular} = \sqrt{(50)^2 - (48)^2} = \sqrt{2500 - 2304} = \sqrt{196} = 14 \text{ m}$$

$\therefore$ Other side of the rectangular plot = 14 m

Length = 48m

Breadth = 14m

$$\therefore \text{Area of the rectangular plot} = 48 \text{ m} \times 14 \text{ m} = 672 \text{ m}^2$$

Hence, the area of a rectangular plot is 672 m².

Q. 3

Answer :

Let the length of the field be 4x m.

Breadth = 3x m

$$\therefore \text{Area of the field} = (4x \times 3x) \text{ m}^2 = 12x^2 \text{ m}^2$$

But it is given that the area is 1728 m².

$$\therefore 12x^2 = 1728$$

$$\Rightarrow x^2 = \left(\frac{1728}{12}\right) = 144$$

$$\Rightarrow x = \sqrt{144} = 12$$

$$\therefore \text{Length} = (4 \times 12) \text{ m} = 48 \text{ m}$$

$$\text{Breadth} = (3 \times 12) \text{ m} = 36 \text{ m}$$

$$\therefore \text{Perimeter of the field} = 2(l + b) \text{ units}$$

$$= 2(48 + 36) \text{ m} = (2 \times 84) \text{ m} = 168 \text{ m}$$

$$\therefore \text{Cost of fencing} = \text{Rs } (168 \times 30) = \text{Rs } 5040$$

Q. 4

Answer :

Area of the rectangular field = 3584 m²

Length of the rectangular field = 64 m

Breadth of the rectangular field = $\left(\frac{\text{Area}}{\text{Length}}\right) = \left(\frac{3584}{64}\right) \text{ m} = 56 \text{ m}$

Perimeter of the rectangular field = 2 (length + breadth)
= 2(64 + 56) m = (2 × 120) m = 240 m

Distance covered by the boy = 5 × Perimeter of the rectangular field
= 5 × 240 = 1200 m

The boy walks at the rate of 6 km/hr.

or

Rate = $\left(\frac{6 \times 1000}{60}\right) \text{ m/min} = 100 \text{ m/min.}$

∴ Required time to cover a distance of 1200 m = $\left(\frac{1200}{100}\right) \text{ min} = 12 \text{ min}$

Hence, the boy will take 12 minutes to go five times around the field.

Q. 5

Answer :

Given:

Length of the verandah = 40 m = 400 dm [since 1 m = 10 dm.]

Breadth of the verandah = 15 m = 150 dm

∴ Area of the verandah = (400 × 150) dm² = 60000 dm²

Length of a stone = 6 dm

Breadth of a stone = 5 dm

∴ Area of a stone = (6 × 5) dm² = 30 dm²

∴ Total number of stones needed to pave the verandah = $\frac{\text{Area of the verandah}}{\text{Area of each stone}}$

$$= \left(\frac{60000}{30}\right) = 2000$$

Q. 6

Answer :

Area of the carpet = Area of the room

$$= (13 \text{ m} \times 9 \text{ m}) = 117 \text{ m}^2$$

Now, width of the carpet = 75 cm (given)

$$= 0.75 \text{ m} \quad [\text{since } 1 \text{ m} = 100 \text{ cm}]$$

Length of the carpet = $\left(\frac{\text{Area of the carpet}}{\text{Width of the carpet}}\right) = \left(\frac{117}{0.75}\right) \text{ m} = 156 \text{ m}$

Rate of carpeting = Rs 105 per m

∴ Total cost of carpeting = Rs (156 × 105) = Rs 16380

Hence, the total cost of carpeting the room is Rs 16380.

Q. 7

Answer :

Given:

Length of the room = 15 m

Width of the carpet = 75 cm = 0.75 m (since 1 m = 100 cm)

Let the length of the carpet required for carpeting the room be x m.

Cost of the carpet = Rs. 80 per m

∴ Cost of x m carpet = Rs. (80 × x) = Rs. (80x)

Cost of carpeting the room = Rs. 19200

$$\therefore 80x = 19200 \Rightarrow x = \left(\frac{19200}{80}\right) = 240$$

Thus, the length of the carpet required for carpeting the room is 240 m.

Area of the carpet required for carpeting the room = Length of the carpet × Width of the carpet
= (240 × 0.75) m² = 180 m²

Let the width of the room be b m.

Area to be carpeted = 15 m × b m = 15b m²

$$\therefore 15b \text{ m}^2 = 180 \text{ m}^2$$

$$\Rightarrow b = \left(\frac{180}{15}\right) \text{ m} = 12 \text{ m}$$

Hence, the width of the room is 12 m.

Q. 8

Answer :

Total cost of fencing a rectangular piece = Rs. 9600

Rate of fencing = Rs. 24

$$\therefore \text{Perimeter of the rectangular field} = \left(\frac{\text{Total cost of fencing}}{\text{Rate of fencing}} \right) \text{ m} = \left(\frac{9600}{24} \right) \text{ m} = 400 \text{ m}$$

Let the length and breadth of the rectangular field be $5x$ and $3x$, respectively.

$$\text{Perimeter of the rectangular land} = 2(5x + 3x) = 16x$$

But the perimeter of the given field is 400 m.

$$\therefore 16x = 400$$

$$x = \left(\frac{400}{16} \right) = 25$$

$$\text{Length of the field} = (5 \times 25) \text{ m} = 125 \text{ m}$$

$$\text{Breadth of the field} = (3 \times 25) \text{ m} = 75 \text{ m}$$

Q. 9

Answer :

$$\begin{aligned} \text{Length of the diagonal of the room} &= \sqrt{l^2 + b^2 + h^2} \\ &= \sqrt{(10)^2 + (10)^2 + (5)^2} \text{ m} \\ &= \sqrt{100 + 100 + 25} \text{ m} \\ &= \sqrt{225} \text{ m} = 15 \text{ m} \end{aligned}$$

Hence, length of the largest pole that can be placed in the given hall is 15 m.

Q. 10

Answer :

$$\text{Side of the square} = 8.5 \text{ m}$$

$$\begin{aligned} \therefore \text{Area of the square} &= (\text{Side})^2 \\ &= (8.5 \text{ m})^2 \\ &= 72.25 \text{ m}^2 \end{aligned}$$

Q. 11

Answer :

$$(i) \text{ Diagonal of the square} = 72 \text{ cm}$$

$$\begin{aligned} \therefore \text{Area of the square} &= \left[\frac{1}{2} \times (\text{Diagonal})^2 \right] \text{ sq. unit} \\ &= \left[\frac{1}{2} \times (72)^2 \right] \text{ cm}^2 \\ &= 2592 \text{ cm}^2 \end{aligned}$$

$$(ii) \text{ Diagonal of the square} = 2.4 \text{ m}$$

$$\begin{aligned} \therefore \text{Area of the square} &= \left[\frac{1}{2} \times (\text{Diagonal})^2 \right] \text{ sq. unit} \\ &= \left[\frac{1}{2} \times (2.4)^2 \right] \text{ m}^2 \\ &= 2.88 \text{ m}^2 \end{aligned}$$

Q. 12

Answer :

We know:

$$\text{Area of a square} = \left\{ \frac{1}{2} \times (\text{Diagonal})^2 \right\} \text{ sq. units}$$

$$\begin{aligned} \text{Diagonal of the square} &= \sqrt{2 \times \text{Area of square units}} \\ &= (\sqrt{2 \times 16200}) \text{ m} = 180 \text{ m} \end{aligned}$$

$$\therefore \text{Length of the diagonal of the square} = 180 \text{ m}$$

Q. 13

Answer :

$$\text{Area of the square} = \left\{ \frac{1}{2} \times (\text{Diagonal})^2 \right\} \text{ sq. units}$$

Given:

$$\text{Area of the square field} = \frac{1}{2} \text{ hectare}$$

$$= \left(\frac{1}{2} \times 10000 \right) \text{ m}^2 = 5000 \text{ m}^2 \quad [\text{since } 1 \text{ hectare} = 10000 \text{ m}^2]$$

$$\text{Diagonal of the square} = \sqrt{2 \times \text{Area of the square}}$$

$$= (\sqrt{2 \times 5000}) \text{ m} = 100 \text{ m}$$

$\therefore$ Length of the diagonal of the square field = 100 m

Q. 14

Answer :

$$\text{Area of the square plot} = 6084 \text{ m}^2$$

$$\begin{aligned} \text{Side of the square plot} &= (\sqrt{\text{Area}}) \\ &= (\sqrt{6084}) \text{ m} \\ &= (\sqrt{78 \times 78}) \text{ m} = 78 \text{ m} \end{aligned}$$

$\therefore$ Perimeter of the square plot = $4 \times \text{side} = (4 \times 78) \text{ m} = 312 \text{ m}$
312 m wire is needed to go along the boundary of the square plot once.

Required length of the wire that can go four times along the boundary = $4 \times \text{Perimeter of the square plot}$
 $= (4 \times 312) \text{ m} = 1248 \text{ m}$

Q. 15

Answer :

$$\text{Side of the square} = 10 \text{ cm}$$

$$\text{Length of the wire} = \text{Perimeter of the square} = 4 \times \text{Side} = 4 \times 10 \text{ cm} = 40 \text{ cm}$$

$$\text{Length of the rectangle (l)} = 12 \text{ cm}$$

Let b be the breadth of the rectangle.

$$\text{Perimeter of the rectangle} = \text{Perimeter of the square}$$

$$\Rightarrow 2(l + b) = 40$$

$$\Rightarrow 2(12 + b) = 40$$

$$\Rightarrow 24 + 2b = 40$$

$$\Rightarrow 2b = 40 - 24 = 16$$

$$\Rightarrow b = \left(\frac{16}{2} \right) \text{ cm} = 8 \text{ cm}$$

$$\therefore \text{Breadth of the rectangle} = 8 \text{ cm}$$

$$\text{Now, Area of the square} = (\text{Side})^2 = (10 \text{ cm} \times 10 \text{ cm}) = 100 \text{ cm}^2$$

$$\text{Area of the rectangle} = l \times b = (12 \text{ cm} \times 8 \text{ cm}) = 96 \text{ cm}^2$$

Hence, the square encloses more area.

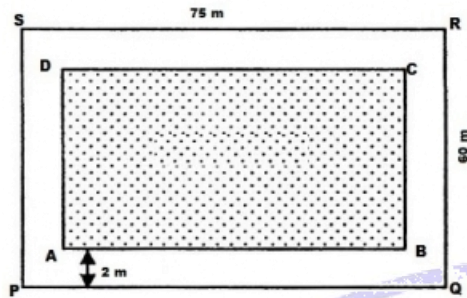
It encloses 4 cm^2 more area.

Exercises – 20 B

Q. 1

Answer :

Let PQRS be the given grassy plot and ABCD be the inside boundary of the path.



Length = 75 m

Breadth = 60 m

Area of the plot = $(75 \times 60) \text{ m}^2 = 4500 \text{ m}^2$

Width of the path = 2 m

$\therefore AB = (75 - 2 \times 2) \text{ m} = (75 - 4) \text{ m} = 71 \text{ m}$

$AD = (60 - 2 \times 2) \text{ m} = (60 - 4) \text{ m} = 56 \text{ m}$

Area of rectangle ABCD = $(71 \times 56) \text{ m}^2 = 3976 \text{ m}^2$

Area of the path = (Area of PQRS - Area of ABCD)
 $= (4500 - 3976) \text{ m}^2 = 524 \text{ m}^2$

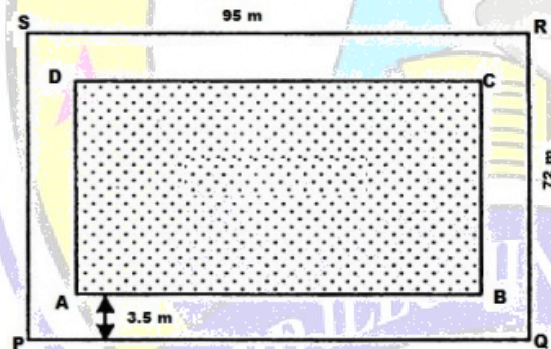
Rate of constructing the path = Rs 125 per m^2

$\therefore$ Total cost of constructing the path = Rs $(524 \times 125) = \text{Rs } 65,500$

Q. 2

Answer :

Let PQRS be the given rectangular plot and ABCD be the inside boundary of the path.



Length = 95 m

Breadth = 72 m

Area of the plot = $(95 \times 72) \text{ m}^2 = 6,840 \text{ m}^2$

Width of the path = 3.5 m

$\therefore AB = (95 - 2 \times 3.5) \text{ m} = (95 - 7) \text{ m} = 88 \text{ m}$

$AD = (72 - 2 \times 3.5) \text{ m} = (72 - 7) \text{ m} = 65 \text{ m}$

Area of the path = (Area PQRS - Area ABCD)
 $= (6840 - 5720) \text{ m}^2 = 1,120 \text{ m}^2$

Rate of constructing the path = Rs. 80 per m^2

$\therefore$ Total cost of constructing the path = Rs. $(1,120 \times 80) = \text{Rs. } 89,600$

Rate of laying the grass on the plot ABCD = Rs. 40 per m^2

$\therefore$ Total cost of laying the grass on the plot = Rs. $(5,720 \times 40) = \text{Rs. } 2,28,800$

$\therefore$ Total expenses involved = Rs. $(89,600 + 2,28,800) = \text{Rs. } 3,18,400$

Q. 3

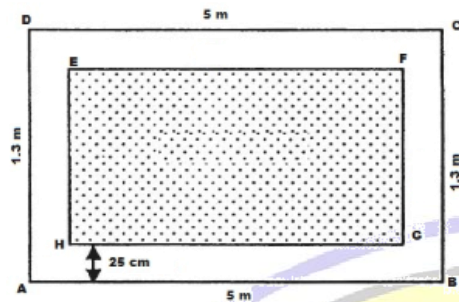
Answer :

Let ABCD be the saree and EFGH be the part of saree without border.

Length, AB = 5 m

Breadth, BC = 1.3 m

Width of the border of the saree = 25 cm = 0.25 m



$$\therefore \text{Area of ABCD} = 5 \text{ m} \times 1.3 \text{ m} = 6.5 \text{ m}^2$$

Length, GH = $\{5 - (0.25 + 0.25)\} \text{ m} = 4.5 \text{ m}$

Breadth, FG = $\{1.3 - 0.25 + 0.25\} \text{ m} = 0.8 \text{ m}$

$$\therefore \text{Area of EFGH} = 4.5 \text{ m} \times 0.8 \text{ m} = 3.6 \text{ m}^2$$

Area of the border = Area of ABCD – Area of EFGH

$$= 6.5 \text{ m}^2 - 3.6 \text{ m}^2$$

$$= 2.9 \text{ m}^2 = 29000 \text{ cm}^2 \quad [\text{since } 1 \text{ m}^2 = 10000 \text{ cm}^2]$$

Rate of printing the border = Rs 1 per 10 cm^2

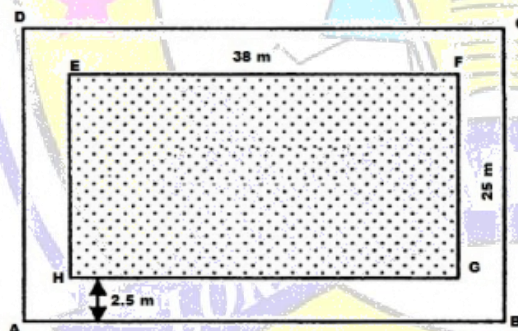
$$\therefore \text{Total cost of printing the border} = \text{Rs} \left(\frac{1 \times 29000}{10} \right) \\ = \text{Rs } 2900$$

Q. 4

Answer :

Length, EF = 38 m

Breadth, FG = 25 m



$$\therefore \text{Area of EFGH} = 38 \text{ m} \times 25 \text{ m} = 950 \text{ m}^2$$

Length, AB = $(38 + 2.5 + 2.5) \text{ m} = 43 \text{ m}$

Breadth, BC = $(25 + 2.5 + 2.5) \text{ m} = 30 \text{ m}$

$$\therefore \text{Area of ABCD} = 43 \text{ m} \times 30 \text{ m} = 1290 \text{ m}^2$$

Area of the path = Area of ABCD – Area of PQRS

$$= 1290 \text{ m}^2 - 950 \text{ m}^2$$

$$= 340 \text{ m}^2$$

Rate of gravelling the path = Rs 120 per m^2

$$\therefore \text{Total cost of gravelling the path} = \text{Rs } (120 \times 340) \\ = \text{Rs } 40800$$

Q. 5

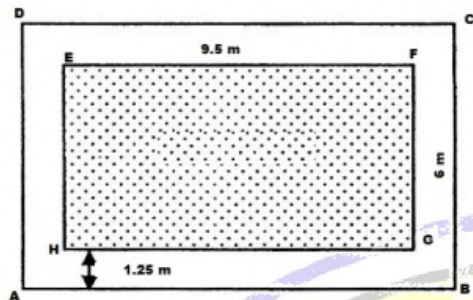
Answer :

Let EFGH denote the floor of the room.

The white region represents the floor of the 1.25 m verandah.

Length, EF = 9.5 m

Breadth, FG = 6 m



$$\therefore \text{Area of EFGH} = 9.5 \text{ m} \times 6 \text{ m} = 57 \text{ m}^2$$

$$\text{Length, AB} = (9.5 + 1.25 + 1.25) \text{ m} = 12 \text{ m}$$

$$\text{Breadth, BC} = (6 + 1.25 + 1.25) \text{ m} = 8.5 \text{ m}$$

$$\therefore \text{Area of ABCD} = 12 \text{ m} \times 8.5 \text{ m} = 102 \text{ m}^2$$

$$\begin{aligned} \text{Area of the verandah} &= \text{Area of ABCD} - \text{Area of EFGH} \\ &= 102 \text{ m}^2 - 57 \text{ m}^2 \\ &= 45 \text{ m}^2 \end{aligned}$$

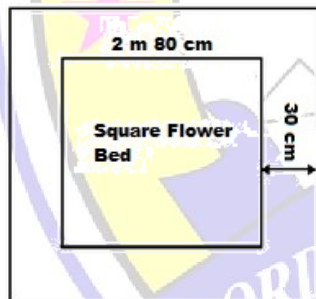
$$\text{Rate of cementing the verandah} = \text{Rs } 80 \text{ per m}^2$$

$$\begin{aligned} \therefore \text{Total cost of cementing the verandah} &= \text{Rs } (80 \times 45) \\ &= \text{Rs } 3600 \end{aligned}$$

Q. 6

Answer :

Side of the flower bed = 2 m 80 cm = 2.80 m [since 100 cm = 1 m]



$$\therefore \text{Area of the square flower bed} = (\text{Side})^2 = (2.80 \text{ m})^2 = 7.84 \text{ m}^2$$

$$\begin{aligned} \text{Side of the flower bed with the digging strip} &= 2.80 \text{ m} + 30 \text{ cm} + 30 \text{ cm} \\ &= (2.80 + 0.3 + 0.3) \text{ m} = 3.4 \text{ m} \end{aligned}$$

$$\text{Area of the enlarged flower bed with the digging strip} = (\text{Side})^2 = (3.4)^2 = 11.56 \text{ m}^2$$

$$\begin{aligned} \therefore \text{Increase in the area of the flower bed} &= 11.56 \text{ m}^2 - 7.84 \text{ m}^2 \\ &= 3.72 \text{ m}^2 \end{aligned}$$

Q. 7

Answer :

Let the length and the breadth of the park be $2x$ m and x m, respectively.

$$\text{Perimeter of the park} = 2(2x + x) = 240 \text{ m}$$

$$\Rightarrow 2(2x + x) = 240$$

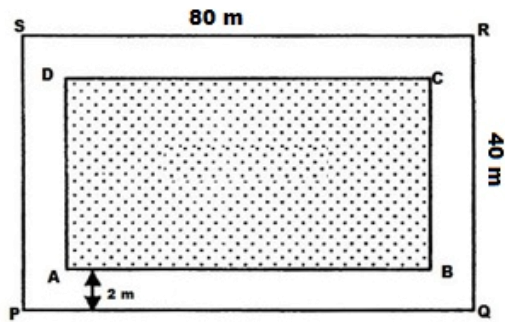
$$\Rightarrow 6x = 240$$

$$\Rightarrow x = \left(\frac{240}{6} \right) \text{ m} = 40 \text{ m}$$

$$\therefore \text{Length of the park} = 2x = (2 \times 40) = 80 \text{ m}$$

$$\text{Breadth} = x = 40 \text{ m}$$

Let PQRS be the given park and ABCD be the inside boundary of the path.



Length = 80 m

Breadth = 40 m

Area of the park = $(80 \times 40) \text{ m}^2 = 3200 \text{ m}^2$

Width of the path = 2 m

$\therefore AB = (80 - 2 \times 2) \text{ m} = (80 - 4) \text{ m} = 76 \text{ m}$

$AD = (40 - 2 \times 2) \text{ m} = (40 - 4) \text{ m} = 36 \text{ m}$

Area of the rectangle ABCD = $(76 \times 36) \text{ m}^2 = 2736 \text{ m}^2$

Area of the path = (Area of PQRS - Area of ABCD)

$= (3200 - 2736) \text{ m}^2 = 464 \text{ m}^2$

Rate of paving the path = Rs. 80 per m^2

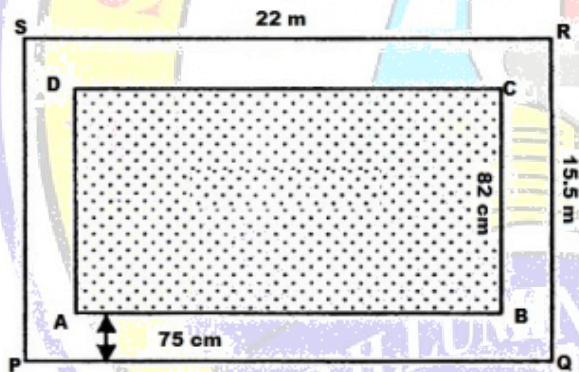
$\therefore$ Total cost of paving the path = Rs. $(464 \times 80) = \text{Rs. } 37,120$

Q. 8

Answer :

Length of the hall, PQ = 22 m

Breadth of the hall, QR = 15.5 m



$\therefore$ Area of the school hall PQRS = $22 \text{ m} \times 15.5 \text{ m} = 341 \text{ m}^2$

Length of the carpet, AB = $22 \text{ m} - (0.75 \text{ m} + 0.75 \text{ m}) = 20.5 \text{ m}$ [since $100 \text{ cm} = 1 \text{ m}$]

Breadth of the carpet, BC = $15.5 \text{ m} - (0.75 \text{ m} + 0.75 \text{ m}) = 14 \text{ m}$

$\therefore$ Area of the carpet ABCD = $20.5 \text{ m} \times 14 \text{ m} = 287 \text{ m}^2$

Area of the strip = Area of the school hall (PQRS) - Area of the carpet (ABCD)

$= 341 \text{ m}^2 - 287 \text{ m}^2$

$= 54 \text{ m}^2$

Area of 1 m length of the carpet = $1 \text{ m} \times 0.82 \text{ m} = 0.82 \text{ m}^2$

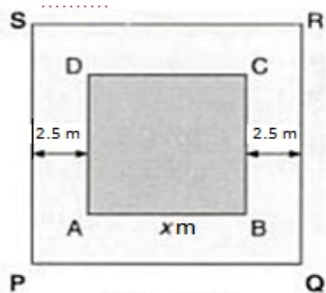
$\therefore$ Length of the carpet whose area is $287 \text{ m}^2 = 287 \text{ m}^2 \div 0.82 \text{ m}^2 = 350 \text{ m}$

Cost of the 350 m long carpet = Rs $60 \times 350 = \text{Rs } 21000$

Q. 9

Answer :

Let ABCD be the square lawn and PQRS be the outer boundary of the square path.



Let a side of the lawn (AB) be x m.

Area of the square lawn = x^2

Length, PQ = $(x \text{ m} + 2.5 \text{ m} + 2.5 \text{ m}) = (x + 5) \text{ m}$

$\therefore$ Area of PQRS = $(x + 5)^2 = (x^2 + 10x + 25) \text{ m}^2$

Area of the path = Area of PQRS – Area of the square lawn (ABCD)

$\Rightarrow 165 = x^2 + 10x + 25 - x^2$

$\Rightarrow 165 = 10x + 25$

$\Rightarrow 165 - 25 = 10x$

$\Rightarrow 140 = 10x$

$\therefore x = 140 \div 10 = 14$

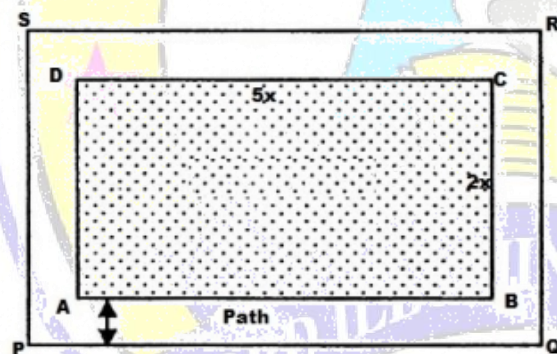
$\therefore$ Side of the lawn = 14 m

$\therefore$ Area of the lawn = $(\text{Side})^2 = (14 \text{ m})^2 = 196 \text{ m}^2$

Q. 10

Answer :

Area of the path = 305 m^2



Let the length of the park be $5x$ m and the breadth of the park be $2x$ m.

$\therefore$ Area of the rectangular park = $5x \times 2x = 10x^2 \text{ m}^2$

Width of the path = 2.5 m

Outer length, PQ = $5x \text{ m} + 2.5 \text{ m} + 2.5 \text{ m} = (5x + 5) \text{ m}$

Outer breadth, QR = $2x + 2.5 \text{ m} + 2.5 \text{ m} = (2x + 5) \text{ m}$

Area of PQRS = $(5x + 5) \times (2x + 5) = (10x^2 + 25x + 10x + 25) = (10x^2 + 35x + 25) \text{ m}^2$

$\therefore$ Area of the path = $[(10x^2 + 35x + 25) - 10x^2] \text{ m}^2$

$\Rightarrow 305 = 35x + 25$

$\Rightarrow 305 - 25 = 35x$

$\Rightarrow 280 = 35x$

$\Rightarrow x = 280 \div 35 = 8$

$\therefore$ Length of the park = $5x = 5 \times 8 = 40 \text{ m}$

Breadth of the park = $2x = 2 \times 8 = 16 \text{ m}$

Chapter – 20 C

Q. 1 **Answer :**

Base = 32 cm

Height = 16.5 cm

$$\begin{aligned}\therefore \text{Area of the parallelogram} &= \text{Base} \times \text{Height} \\ &= 32 \text{ cm} \times 16.5 \text{ cm} \\ &= 528 \text{ cm}^2\end{aligned}$$

Q. 2 **Answer :**

Base = 1 m 60 cm = 1.6 m [since 100 cm = 1 m]

Height = 75 cm = 0.75 m

$$\begin{aligned}\therefore \text{Area of the parallelogram} &= \text{Base} \times \text{Height} \\ &= 1.6 \text{ m} \times 0.75 \text{ m} \\ &= 1.2 \text{ m}^2\end{aligned}$$

Q. 3 **Answer :**

(i) Base = 14 dm = (14 × 10) cm = 140 cm [since 1 dm = 10 cm]

Height = 6.5 dm = (6.5 × 10) cm = 65 cm

$$\begin{aligned}\text{Area of the parallelogram} &= \text{Base} \times \text{Height} \\ &= 140 \text{ cm} \times 65 \text{ cm} \\ &= 9100 \text{ cm}^2\end{aligned}$$

(ii) Base = 14 dm = (14 × 10) cm [since 1 dm = 10 cm and 100 cm = 1 m]

= 140 cm = 1.4 m

Height = 6.5 dm = (6.5 × 10) cm

= 65 cm = 0.65 m

$$\begin{aligned}\therefore \text{Area of the parallelogram} &= \text{Base} \times \text{Height} \\ &= 1.4 \text{ m} \times 0.65 \text{ m} \\ &= 0.91 \text{ m}^2\end{aligned}$$

Q. 4 **Answer :**

Area of the given parallelogram = 54 cm²

Base of the given parallelogram = 15 cm

$$\therefore \text{Height of the given parallelogram} = \frac{\text{Area}}{\text{Base}} = \left(\frac{54}{15} \right) \text{ cm} = 3.6 \text{ cm}$$

Q. 5

Answer :

Base of the parallelogram = 18 cm

Area of the parallelogram = 153 cm²

$\therefore$ Area of the parallelogram = Base × Height

$$\Rightarrow \text{Height} = \frac{\text{Area of the parallelogram}}{\text{Base}} = \left(\frac{153}{18} \right) \text{ cm} = 8.5 \text{ cm}$$

Hence, the distance of the given side from its opposite side is 8.5 cm.

Q. 6

Answer :

Base, AB = 18 cm

Height, AL = 6.4 cm

$$\begin{aligned}\therefore \text{Area of the parallelogram ABCD} &= \text{Base} \times \text{Height} \\ &= (18 \text{ cm} \times 6.4 \text{ cm}) = 115.2 \text{ cm}^2 \quad \dots (i)\end{aligned}$$

Now, taking BC as the base:

$$\begin{aligned}\text{Area of the parallelogram ABCD} &= \text{Base} \times \text{Height} \\ &= (12 \text{ cm} \times \text{AM}) \quad \dots (ii)\end{aligned}$$

From equation (i) and (ii):

$$12 \text{ cm} \times \text{AM} = 115.2 \text{ cm}^2$$

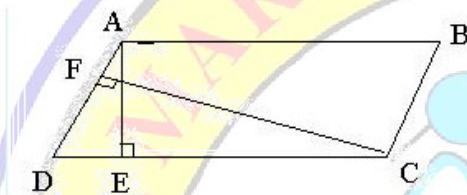
$$\Rightarrow \text{AM} = \left(\frac{115.2}{12} \right) \text{ cm}$$

$$= 9.6 \text{ cm}$$

Q. 7

Answer :

ABCD is a parallelogram with side AB of length 15 cm and the corresponding altitude AE of length 4 cm. The adjacent side AD is of length 8 cm and the corresponding altitude is CF.



Area of a parallelogram = Base $\times$ Height

We have two altitudes and two corresponding bases.

$$\therefore AD \times CF = AB \times AE$$

$$\Rightarrow 8 \text{ cm} \times CF = 15 \text{ cm} \times 4 \text{ cm}$$

$$\Rightarrow CF = \left(\frac{15 \times 4}{8} \right) \text{ cm} = \left(\frac{15}{2} \right) \text{ cm} = 7.5 \text{ cm}$$

Hence, the distance between the shorter sides is 7.5 cm.

Q. 8

Answer :

Let the base of the parallelogram be x cm.

Then, the height of the parallelogram will be $\frac{1}{3}x$ cm.

It is given that the area of the parallelogram is 108 cm^2 .

Area of a parallelogram = Base $\times$ Height

$$\therefore 108 \text{ cm}^2 = x \times \frac{1}{3}x$$

$$108 \text{ cm}^2 = \frac{1}{3}x^2$$

$$\Rightarrow x^2 = (108 \times 3) \text{ cm}^2 = 324 \text{ cm}^2$$

$$\Rightarrow x^2 = (18 \text{ cm})^2$$

$$\Rightarrow x = 18 \text{ cm}$$

$$\therefore \text{Base} = x = 18 \text{ cm}$$

$$\begin{aligned}\text{Height} &= \frac{1}{3}x = \left(\frac{1}{3} \times 18 \right) \text{ cm} \\ &= 6 \text{ cm}\end{aligned}$$

Q. 9

Answer :

Let the height of the parallelogram be x cm.

Then, the base of the parallelogram will be $2x$ cm.

It is given that the area of the parallelogram is 512 cm^2 .

Area of a parallelogram = Base $\times$ Height

$$\therefore 512 \text{ cm}^2 = 2x \times x$$

$$512 \text{ cm}^2 = 2x^2$$

$$\Rightarrow x^2 = \left(\frac{512}{2}\right) \text{ cm}^2 = 256 \text{ cm}^2$$

$$\Rightarrow x^2 = (16 \text{ cm})^2$$

$$\Rightarrow x = 16 \text{ cm}$$

$$\therefore \text{Base} = 2x = 2 \times 16 \\ = 32 \text{ cm}$$

$$\text{Height} = x = 16 \text{ cm}$$

Q. 10

Answer :

A rhombus is a special type of a parallelogram.

The area of a parallelogram is given by the product of its base and height.

$\therefore$ Area of the given rhombus = Base $\times$ Height

(i) Area of the rhombus = $12 \text{ cm} \times 7.5 \text{ cm} = 90 \text{ cm}^2$

(ii) Base = $2 \text{ dm} = (2 \times 10) = 20 \text{ cm}$ [since $1 \text{ dm} = 10 \text{ cm}$]

Height = 12.6 cm

$\therefore$ Area of the rhombus = $20 \text{ cm} \times 12.6 \text{ cm} = 252 \text{ cm}^2$

Q. 11

Answer :

(i)

Length of one diagonal = 16 cm

Length of the other diagonal = 28 cm

$\therefore$ Area of the rhombus = $\frac{1}{2} \times (\text{Product of the diagonals})$
 $= \left(\frac{1}{2} \times 16 \times 28\right) \text{ cm}^2 = 224 \text{ cm}^2$

(ii)

Length of one diagonal = $8 \text{ dm } 5 \text{ cm} = (8 \times 10 + 5) \text{ cm} = 85 \text{ cm}$ [since $1 \text{ dm} = 10 \text{ cm}$]

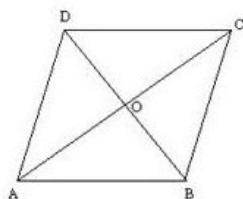
Length of the other diagonal = $5 \text{ dm } 6 \text{ cm} = (5 \times 10 + 6) \text{ cm} = 56 \text{ cm}$

$\therefore$ Area of the rhombus = $\frac{1}{2} \times (\text{Product of the diagonals})$
 $= \left(\frac{1}{2} \times 85 \times 56\right) \text{ cm}^2$
 $= 2380 \text{ cm}^2$

Q. 12

Answer :

Let ABCD be the rhombus, whose diagonals intersect at O.



$AB = 20 \text{ cm}$ and $AC = 24 \text{ cm}$

The diagonals of a rhombus bisect each other at right angles.

Therefore, $\triangle AOB$ is a right angled triangle, right angled at O.

Here, $OA = \frac{1}{2} AC = 12 \text{ cm}$

$AB = 20 \text{ cm}$

By Pythagoras theorem:

$$(AB)^2 = (OA)^2 + (OB)^2$$

$$\Rightarrow (20)^2 = (12)^2 + (OB)^2$$

$$\Rightarrow (OB)^2 = (20)^2 - (12)^2$$

$$\Rightarrow (OB)^2 = 400 - 144 = 256$$

$$\Rightarrow (OB)^2 = (16)^2$$

$$\Rightarrow OB = 16 \text{ cm}$$

$$\therefore BD = 2 \times OB = 2 \times 16 \text{ cm} = 32 \text{ cm}$$

$$\begin{aligned}\therefore \text{Area of the rhombus ABCD} &= \left(\frac{1}{2} \times AC \times BD\right) \text{ cm}^2 \\ &= \left(\frac{1}{2} \times 24 \times 32\right) \text{ cm}^2 \\ &= 384 \text{ cm}^2\end{aligned}$$

Q. 13

Answer :

$$\text{Area of a rhombus} = \frac{1}{2} \times (\text{Product of the diagonals})$$

Given:

$$\text{Length of one diagonal} = 19.2 \text{ cm}$$

$$\text{Area of the rhombus} = 148.8 \text{ cm}^2$$

$$\therefore \text{Length of the other diagonal} = \left(\frac{148.8 \times 2}{19.2}\right) \text{ cm} = 15.5 \text{ cm}$$

Q. 14

Answer :

$$\text{Perimeter of the rhombus} = 56 \text{ cm}$$

$$\text{Area of the rhombus} = 119 \text{ cm}^2$$

$$\text{Side of the rhombus} = \frac{\text{Perimeter}}{4} = \left(\frac{56}{4}\right) \text{ cm} = 14 \text{ cm}$$

$$\text{Area of a rhombus} = \text{Base} \times \text{Height}$$

$$\begin{aligned}\therefore \text{Height of the rhombus} &= \frac{\text{Area}}{\text{Base}} = \left(\frac{119}{14}\right) \text{ cm} \\ &= 8.5 \text{ cm}\end{aligned}$$

Q. 15

Answer :

Given:

$$\text{Height of the rhombus} = 17.5 \text{ cm}$$

$$\text{Area of the rhombus} = 441 \text{ cm}^2$$

We know:

$$\text{Area of a rhombus} = \text{Base} \times \text{Height}$$

$$\therefore \text{Base of the rhombus} = \frac{\text{Area}}{\text{Height}} = \left(\frac{441}{17.5}\right) \text{ cm} = 25.2 \text{ cm}$$

Hence, each side of a rhombus is 25.2 cm.

Chapter – D

Q. 1

Answer :

We know:

$$\text{Area of a triangle} = \frac{1}{2} \times \text{Base} \times \text{Height}$$

$$(i) \text{ Base} = 42 \text{ cm}$$

$$\text{Height} = 25 \text{ cm}$$

$$\therefore \text{Area of the triangle} = \left(\frac{1}{2} \times 42 \times 25\right) \text{ cm}^2 = 525 \text{ cm}^2$$

$$(ii) \text{ Base} = 16.8 \text{ m}$$

$$\text{Height} = 75 \text{ cm} = 0.75 \text{ m} \quad [\text{since } 100 \text{ cm} = 1 \text{ m}]$$

$$\therefore \text{Area of the triangle} = \left(\frac{1}{2} \times 16.8 \times 0.75\right) \text{ m}^2 = 6.3 \text{ m}^2$$

$$(iii) \text{ Base} = 8 \text{ dm} = (8 \times 10) \text{ cm} = 80 \text{ cm} \quad [\text{since } 1 \text{ dm} = 10 \text{ cm}]$$

$$\text{Height} = 35 \text{ cm}$$

$$\therefore \text{Area of the triangle} = \left(\frac{1}{2} \times 80 \times 35\right) \text{ cm}^2 = 1400 \text{ cm}^2$$

Q. 2

Answer :

Height of a triangle = $\frac{2 \times \text{Area}}{\text{Base}}$

Here, base = 16 cm and area = 72 cm²

$$\therefore \text{Height} = \frac{2 \times 72}{16} \text{ cm} = 9 \text{ cm}$$

Q. 3

Answer :

Height of a triangle = $\frac{2 \times \text{Area}}{\text{Base}}$

Here, base = 28 m and area = 224 m²

$$\therefore \text{Height} = \left(\frac{2 \times 224}{28} \right) \text{ m} = 16 \text{ m}$$

Q. 4

Answer :

Base of a triangle = $\frac{2 \times \text{Area}}{\text{Height}}$

Here, height = 12 cm and area = 90 cm²

$$\therefore \text{Base} = \left(\frac{2 \times 90}{12} \right) \text{ cm} = 15 \text{ cm}$$

Q. 5

Answer :

Total cost of cultivating the field = Rs. 14580

Rate of cultivating the field = Rs. 1080 per hectare

$$\begin{aligned} \text{Area of the field} &= \left(\frac{\text{Total cost}}{\text{Rate per hectare}} \right) \text{ hectare} \\ &= \left(\frac{14580}{1080} \right) \text{ hectare} \\ &= 13.5 \text{ hectare} \\ &= (13.5 \times 10000) \text{ m}^2 = 135000 \text{ m}^2 \quad [\text{since } 1 \text{ hectare} = 10000 \text{ m}^2] \end{aligned}$$

Let the height of the field be x m.

Then, its base will be $3x$ m.

$$\text{Area of the field} = \left(\frac{1}{2} \times 3x \times x \right) \text{ m}^2 = \left(\frac{3x^2}{2} \right) \text{ m}^2$$

$$\therefore \left(\frac{3x^2}{2} \right) = 135000$$

$$\Rightarrow x^2 = \left(135000 \times \frac{2}{3} \right) = 90000$$

$$\Rightarrow x = \sqrt{90000} = 300$$

$$\therefore \text{Base} = (3 \times 300) = 900 \text{ m}$$

$$\text{Height} = 300 \text{ m}$$

Q. 6

Answer :

Let the length of the other leg be h cm.

$$\text{Then, area of the triangle} = \left(\frac{1}{2} \times 14.8 \times h \right) \text{ cm}^2 = (7.4 h) \text{ cm}^2$$

But it is given that the area of the triangle is 129.5 cm².

$$\therefore 7.4h = 129.5$$

$$\Rightarrow h = \left(\frac{129.5}{7.4} \right) = 17.5 \text{ cm}$$

$$\therefore \text{Length of the other leg} = 17.5 \text{ cm}$$

Q. 7

Here, base = 1.2 m and hypotenuse = 3.7 m

In the right angled triangle:

$$\text{Perpendicular} = \sqrt{(\text{Hypotenuse})^2 - (\text{Base})^2}$$

$$= \sqrt{(3.7)^2 - (1.2)^2}$$

$$= \sqrt{13.69 - 1.44}$$

$$= \sqrt{12.25}$$

$$= 3.5$$

$$\text{Area} = \left(\frac{1}{2} \times \text{base} \times \text{perpendicular} \right) \text{ sq. units}$$

$$= \left(\frac{1}{2} \times 1.2 \times 3.5 \right) \text{ m}^2$$

$$\therefore \text{Area of the right angled triangle} = 2.1 \text{ m}^2$$

Q. 8

Answer :

In a right angled triangle, if one leg is the base, then the other leg is the height.

Let the given legs be $3x$ and $4x$, respectively.

$$\text{Area of the triangle} = \left(\frac{1}{2} \times 3x \times 4x \right) \text{ cm}^2$$

$$\Rightarrow 1014 = (6x^2)$$

$$\Rightarrow 1014 = 6x^2$$

$$\Rightarrow x^2 = \left(\frac{1014}{6} \right) = 169$$

$$\Rightarrow x = \sqrt{169} = 13$$

$$\therefore \text{Base} = (3 \times 13) = 39 \text{ cm}$$

$$\text{Height} = (4 \times 13) = 52 \text{ cm}$$

Q. 9

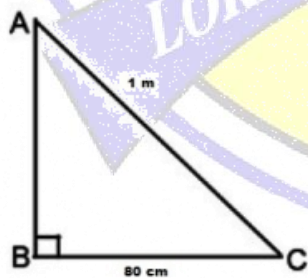
Answer :

Consider a right-angled triangular scarf (ABC).

Here, $\angle B = 90^\circ$

$BC = 80 \text{ cm}$

$AC = 1 \text{ m} = 100 \text{ cm}$



$$\text{Now, } AB^2 + BC^2 = AC^2$$

$$\Rightarrow AB^2 = AC^2 - BC^2 = (100)^2 - (80)^2$$

$$= (10000 - 6400) = 3600$$

$$\Rightarrow AB = \sqrt{3600} = 60 \text{ cm}$$

$$\text{Area of the scarf ABC} = \left(\frac{1}{2} \times BC \times AB \right) \text{ sq. units}$$

$$= \left(\frac{1}{2} \times 80 \times 60 \right) \text{ cm}^2$$

$$= 2400 \text{ cm}^2 = 0.24 \text{ m}^2 \quad [\text{since } 1 \text{ m}^2 = 10000 \text{ cm}^2]$$

Rate of the cloth = Rs 250 per m^2

$\therefore$ Total cost of the scarf = Rs (250×0.24) = Rs 60

Hence, cost of the right angled scarf is Rs 60.

Q. 10 **Answer :**

(i) Side of the equilateral triangle = 18 cm

$$\begin{aligned}\text{Area of the equilateral triangle} &= \frac{\sqrt{3}}{4} (\text{Side})^2 \text{ sq. units} \\ &= \frac{\sqrt{3}}{4} (18)^2 \text{ cm}^2 = (\sqrt{3} \times 81) \text{ cm}^2 \\ &= (1.73 \times 81) \text{ cm}^2 = 140.13 \text{ cm}^2\end{aligned}$$

(ii) Side of the equilateral triangle = 20 cm

$$\begin{aligned}\text{Area of the equilateral triangle} &= \frac{\sqrt{3}}{4} (\text{Side})^2 \text{ sq. units} \\ &= \frac{\sqrt{3}}{4} (20)^2 \text{ cm}^2 = (\sqrt{3} \times 100) \text{ cm}^2 \\ &= (1.73 \times 100) \text{ cm}^2 = 173 \text{ cm}^2\end{aligned}$$

Chapter - E

Q. 1 **Answer :**

Here, $r = 15$ cm

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r \\ &= (2 \times 3.14 \times 15) \text{ cm} \\ &= 94.2 \text{ cm}\end{aligned}$$

Hence, the circumference of the given circle is 94.2 cm

Q. 2 **Answer :**

(i) Here, $r = 28$ cm

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r \\ &= \left(2 \times \frac{22}{7} \times 28\right) \text{ cm} \\ &= 176 \text{ cm}\end{aligned}$$

Hence, the circumference of the given circle is 176 cm.

(ii) Here, $r = 1.4$ m

$$\begin{aligned}\therefore \text{Circumference} &= 2\pi r \\ &= \left(2 \times \frac{22}{7} \times 1.4\right) \text{ m} \\ &= (2 \times 22 \times 0.2) \text{ m} = 8.8 \text{ m}\end{aligned}$$

Hence, the circumference of the given circle is 8.8 m.

Q. 3 **Answer :**

(i) Here, $d = 35$ cm

$$\begin{aligned}\text{Circumference} &= 2\pi r \\ &= (\pi d) \quad [\text{since } 2r = d] \\ &= \left(\frac{22}{7} \times 35\right) \text{ cm} = (22 \times 5) = 110 \text{ cm}\end{aligned}$$

Hence, the circumference of the given circle is 110 cm.

(ii) Here, $d = 4.9$ m

$$\begin{aligned}\text{Circumference} &= 2\pi r \\ &= (\pi d) \quad [\text{since } 2r = d] \\ &= \left(\frac{22}{7} \times 4.9\right) \text{ m} = (22 \times 0.7) = 15.4 \text{ m}\end{aligned}$$

Hence, the circumference of the given circle is 15.4 m.

Q. 4

Answer :

Circumference of the given circle = 57.2 cm

$$\therefore C = 57.2 \text{ cm}$$

Let the radius of the given circle be r cm.

$$C = 2\pi r$$

$$\Rightarrow r = \frac{C}{2\pi} \text{ cm}$$

$$\Rightarrow r = \left(\frac{57.2}{2} \times \frac{7}{22} \right) \text{ cm} = 9.1 \text{ cm}$$

Thus, radius of the given circle is 9.1 cm.

Q. 5

Answer :

Circumference of the given circle = 63.8 m

$$\therefore C = 63.8 \text{ m}$$

Let the radius of the given circle be r cm.

$$C = 2\pi r$$

$$\Rightarrow r = \frac{C}{2\pi}$$

$$\Rightarrow r = \left(\frac{63.8}{2} \times \frac{7}{22} \right) \text{ m} = 10.15 \text{ m}$$

$$\therefore \text{Diameter of the given circle} = 2r = (2 \times 10.15) \text{ m} = 20.3 \text{ m}$$

Q. 6

Answer :

Let the radius of the given circle be r cm.

Then, its circumference = $2\pi r$

Given:

$$(\text{Circumference}) - (\text{Diameter}) = 30 \text{ cm}$$

$$\therefore (2\pi r - 2r) = 30$$

$$\Rightarrow 2r(\pi - 1) = 30$$

$$\Rightarrow 2r \left(\frac{22}{7} - 1 \right) = 30$$

$$\Rightarrow 2r \times \frac{15}{7} = 30$$

$$\Rightarrow r = \left(30 \times \frac{7}{30} \right) = 7$$

$$\therefore \text{Radius of the given circle} = 7 \text{ cm}$$

Q. 7

Answer :

Let the radii of the given circles be $5x$ and $3x$, respectively.

Let their circumferences be C_1 and C_2 , respectively.

$$C_1 = 2 \times \pi \times 5x = 10\pi x$$

$$C_2 = 2 \times \pi \times 3x = 6\pi x$$

$$\therefore \frac{C_1}{C_2} = \frac{10\pi x}{6\pi x} = \frac{5}{3}$$

$$\Rightarrow C_1 : C_2 = 5 : 3$$

Hence, the ratio of the circumference of the given circle is 5:3.

Q. 8

Answer :

Radius of the circular field, $r = 21$ m.

Distance covered by the cyclist = Circumference of the circular field

$$= 2\pi r$$

$$= \left(2 \times \frac{22}{7} \times 21\right) \text{ m} = 132 \text{ m}$$

$$\text{Speed of the cyclist} = 8 \text{ km per hour} = \frac{8000 \text{ m}}{(60 \times 60) \text{ s}} = \left(\frac{8000}{3600}\right) \text{ m/s} = \left(\frac{20}{9}\right) \text{ m/s}$$

$$\text{Time taken by the cyclist to cover the field} = \frac{\text{Distance covered by the cyclist}}{\text{Speed of the cyclist}}$$

$$= \left[\frac{132}{\left(\frac{20}{9}\right)} \right] \text{ s}$$

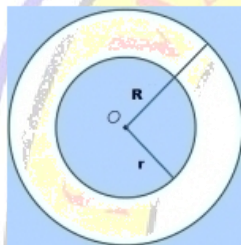
$$= \left(\frac{132 \times 9}{20} \right) \text{ s}$$

$$= 59.4 \text{ s}$$

Q. 9

Answer :

Let the inner and outer radii of the track be r metres and R metres, respectively.



$$\text{Then, } 2\pi r = 528$$

$$2\pi R = 616$$

$$\Rightarrow 2 \times \frac{22}{7} \times r = 528$$

$$2 \times \frac{22}{7} \times R = 616$$

$$\Rightarrow r = \left(528 \times \frac{7}{44}\right) = 84$$

$$R = \left(616 \times \frac{7}{44}\right) = 98$$

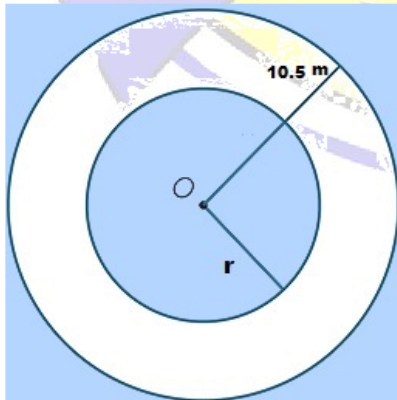
$$\Rightarrow (R - r) = (98 - 84) \text{ m} = 14 \text{ m}$$

Hence, the width of the track is 14 m.

Q. 10

Answer :

Let the inner and outer radii of the track be r metres and $(r + 10.5)$ metres, respectively.



$$\text{Inner circumference} = 330 \text{ m}$$

$$\therefore 2\pi r = 330 \Rightarrow 2 \times \frac{22}{7} \times r = 330$$

$$\Rightarrow r = \left(330 \times \frac{7}{44}\right) = 52.5 \text{ m}$$

$$\text{Inner radius of the track} = 52.5 \text{ m}$$

$$\therefore \text{Outer radii of the track} = (52.5 + 10.5) \text{ m} = 63 \text{ m}$$

$$\therefore \text{Circumference of the outer circle} = \left(2 \times \frac{22}{7} \times 63\right) \text{ m} = 396 \text{ m}$$

Rate of fencing = Rs. 20 per metre

$$\therefore \text{Total cost of fencing the outer circle} = \text{Rs. } (396 \times 20) = \text{Rs. } 7920$$

Chapter - F

Q. 1

Answer :

(i) Given:

$$r = 21 \text{ cm}$$

$$\begin{aligned} \therefore \text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 21 \times 21\right) \text{ cm}^2 = (22 \times 3 \times 21) \text{ cm}^2 = 1386 \text{ cm}^2 \end{aligned}$$

(ii) Given:

$$r = 3.5 \text{ m}$$

$$\begin{aligned} \text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 3.5 \times 3.5\right) \text{ m}^2 = (22 \times 0.5 \times 3.5) \text{ m}^2 = 38.5 \text{ m}^2 \end{aligned}$$

Q. 2

Answer :

(i) Given:

$$d = 28 \text{ cm} \Rightarrow r = \left(\frac{d}{2}\right) = \left(\frac{28}{2}\right) \text{ cm} = 14 \text{ cm}$$

$$\begin{aligned} \text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 14 \times 14\right) \text{ cm}^2 = (22 \times 2 \times 14) \text{ cm}^2 = 616 \text{ cm}^2 \end{aligned}$$

(ii) Given:

$$r = 1.4 \text{ m} \Rightarrow r = \left(\frac{d}{2}\right) = \left(\frac{1.4}{2}\right) \text{ m} = 0.7 \text{ m}$$

$$\begin{aligned} \text{Area of the circle} &= (\pi r^2) \text{ sq. units} \\ &= \left(\frac{22}{7} \times 0.7 \times 0.7\right) \text{ m}^2 = (22 \times 0.1 \times 0.7) \text{ m}^2 = 1.54 \text{ m}^2 \end{aligned}$$

Q. 3

Answer :

Let the radius of the circle be r cm.

$$\text{Circumference} = (2\pi r) \text{ cm}$$

$$\therefore (2\pi r) = 264$$

$$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 264$$

$$\Rightarrow r = \left(\frac{264 \times 7}{2 \times 22}\right) = 42$$

$$\begin{aligned} \therefore \text{Area of the circle} &= \pi r^2 \\ &= \left(\frac{22}{7} \times 42 \times 42\right) \text{ cm}^2 \\ &= 5544 \text{ cm}^2 \end{aligned}$$

Q. 4

Answer :

Let the radius of the circle be r m.

Then, its circumference will be $(2\pi r)$ m.

$$\therefore (2\pi r) = 35.2$$

$$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 35.2$$

$$\Rightarrow r = \left(\frac{35.2 \times 7}{2 \times 22}\right) = 5.6$$

$$\begin{aligned} \therefore \text{Area of the circle} &= \pi r^2 \\ &= \left(\frac{22}{7} \times 5.6 \times 5.6\right) \text{ m}^2 = 98.56 \text{ m}^2 \end{aligned}$$

Q. 5

Answer :

Let the radius of the circle be r cm.

Then, its area will be πr^2 cm².

$$\therefore \pi r^2 = 616$$

$$\Rightarrow \left(\frac{22}{7} \times r \times r \right) = 616$$

$$\Rightarrow r^2 = \left(\frac{616 \times 7}{22} \right) = 196$$

$$\Rightarrow r = \sqrt{196} = 14$$

$$\begin{aligned} \Rightarrow \text{Circumference of the circle} &= (2\pi r) \text{ cm} \\ &= \left(2 \times \frac{22}{7} \times 14 \right) \text{ cm} = 88 \text{ cm} \end{aligned}$$

Q. 6

Answer :

Let the radius of the circle be r m.

Then, area = πr^2 m²

$$\therefore \pi r^2 = 1386$$

$$\Rightarrow \left(\frac{22}{7} \times r \times r \right) = 1386$$

$$\Rightarrow r^2 = \left(\frac{1386 \times 7}{22} \right) = 441$$

$$\Rightarrow r = \sqrt{441} = 21$$

$$\begin{aligned} \Rightarrow \text{Circumference of the circle} &= (2\pi r) \text{ m} \\ &= \left(2 \times \frac{22}{7} \times 21 \right) \text{ m} = 132 \text{ m} \end{aligned}$$

Q. 7

Answer :

Let r_1 and r_2 be the radii of the two given circles and A_1 and A_2 be their respective areas.

$$\frac{r_1}{r_2} = \frac{4}{5}$$

$$\therefore \frac{A_1}{A_2} = \frac{\pi r_1^2}{\pi r_2^2} = \frac{r_1^2}{r_2^2} = \left(\frac{r_1}{r_2} \right)^2 = \left(\frac{4}{5} \right)^2 = \frac{16}{25}$$

Hence, the ratio of the areas of the given circles is 16:25.

Q. 8

Answer :

If the horse is tied to a pole, then the pole will be the central point and the area over which the horse will graze will be a circle. The string by which the horse is tied will be the radius of the circle.

Thus,

Radius of the circle (r) = Length of the string = 21 m

$$\text{Now, area of the circle} = \pi r^2 = \left(\frac{22}{7} \times 21 \times 21 \right) \text{ m}^2 = 1386 \text{ m}^2$$

$$\therefore \text{Required area} = 1386 \text{ m}^2$$

Q. 9

Answer :

Let a be one side of the square.

Area of the square = 121 cm^2 (given)

$$\Rightarrow a^2 = 121$$

$$\Rightarrow a = 11 \text{ cm (since } 11 \times 11 = 121)$$

Perimeter of the square = $4 \times \text{side} = 4a = (4 \times 11) \text{ cm} = 44 \text{ cm}$

Length of the wire = Perimeter of the square

$$= 44 \text{ cm}$$

The wire is bent in the form of a circle.

Circumference of a circle = Length of the wire

$\therefore$ Circumference of a circle = 44 cm

$$\Rightarrow 2\pi r = 44$$

$$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 44$$

$$\Rightarrow r = \left(\frac{44 \times 7}{2 \times 22}\right) = 7 \text{ cm}$$

$\therefore$ Area of the circle = πr^2

$$= \left(\frac{22}{7} \times 7 \times 7\right) \text{ cm}^2$$

$$= 154 \text{ cm}^2$$

Q. 10

Answer :

It is given that the radius of the circle is 28 cm .

Length of the wire = Circumference of the circle

$$\Rightarrow \text{Circumference of the circle} = 2\pi r = \left(2 \times \frac{22}{7} \times 28\right) \text{ cm} = 176 \text{ cm}$$

Let the wire be bent into the form of a square of side $a \text{ cm}$.

Perimeter of the square = 176 cm

$$\Rightarrow 4a = 176$$

$$\Rightarrow a = \left(\frac{176}{4}\right) \text{ cm} = 44 \text{ cm}$$

Thus, each side of the square is 44 cm .

Area of the square = $(\text{Side})^2 = (a)^2 = (44 \text{ cm})^2$

$$= 1936 \text{ cm}^2$$

$\therefore$ Required area of the square formed = 1936 cm^2

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