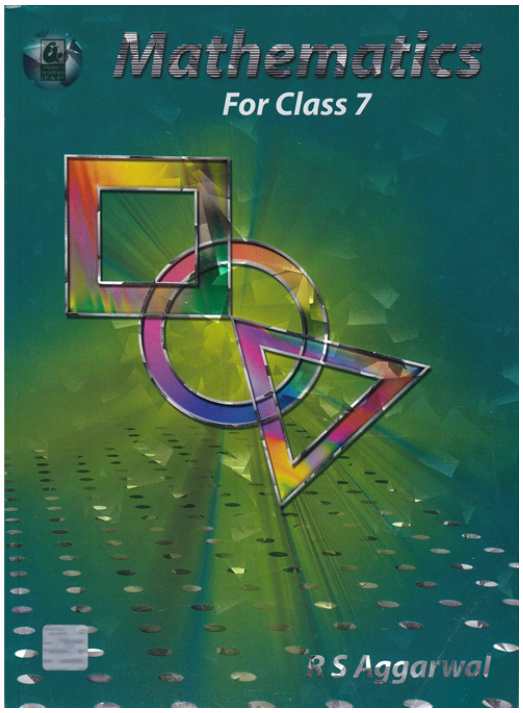
RS Aggarwal Solutions for Class 7 Maths Chapter 20–Mensuration

Class 7 - Chapter 20 Mensuration



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RS Aggarwal Solutions for Class 7 Maths Chapter 20–Mensuration

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RS Aggarwal Solutions for Class 7 Maths Chapter 20–Mensuration

RS Aggarwal 7th Maths Chapter 20, Class 7 Maths Chapter 20 solutions

Q1

Answer :

(i) Length = 24.5 m
Breadth = 18 m

∴ Area of the rectangle = Length × Breadth
= 24.5 m × 18 m
= 441 m^2

(ii) Length = 12.5 m
Breadth = 8 dm = (8 × 10) = 80 cm = 0.8 m [since 1 dm = 10 cm and 1 m = 100 cm]

∴ Area of the rectangle = Length × Breadth
= 12.5 m × 0.8 m
= 10 m^2

Q2

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

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

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

∴ Other side of the rectangular plot = 14 m
Length = 48m
Breadth = 14m

∴ Area of the rectangular plot = 48 m × 14 m = 672 m^2
Hence, the area of a rectangular plot is 672 m^2.

Q3

Answer :

Let the length of the field be $4x$ m.
Breadth = $3x$ m
∴ Area of the field = $(4x \times 3x)$ m^2 = $12x^2$ m^2
But it is given that the area is 1728 m^2.
∴ $12x^2 = 1728$
$\Rightarrow x^2 = \left(\frac{1728}{12}\right) = 144$
$\Rightarrow x = \sqrt{144} = 12$
∴ Length = (4×12) m = 48 m
Breadth = (3×12) m =36 m
∴ Perimeter of the field = $2(l + b)$ units
= 2(48 + 36) m = (2×84) m = 168 m
∴ Cost of fencing = Rs (168×30) = Rs 5040

Q5

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) dm^2 = 60000 dm^2

Length of a stone = 6 dm
Breadth of a stone = 5 dm
∴ Area of a stone = (6 × 5) dm^2 = 30 dm^2

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

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

Q6

Answer :

Area of the carpet = Area of the room
= (13 m × 9 m) = 117 m^2

Now, width of the carpet = 75 cm (given)
= 0.75 m [since 1 m = 100 cm]

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

Q7

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. $(80 \times x)$ = Rs. $(80x)$
Cost of carpeting the room = Rs. 19200
∴ $80x = 19200 \Rightarrow x = \left(\frac{19200}{80}\right) = 240$
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
$= (240 \times 0.75)\ m^2 = 180\ m^2$
Let the width of the room be b m.
Area to be carpeted = 15 m × b m = $15b\ m^2$
∴ $15b\ m^2 = 180\ m^2$
$\Rightarrow b = \left(\frac{180}{15}\right)$ m = 12 m
Hence, the width of the room is 12 m.

Q8

Answer :

Total cost of fencing a rectangular piece = Rs. 9600
Rate of fencing = Rs. 24
∴ Perimeter of the rectangular field = $\left(\frac{\text{Total cost of fencing}}{\text{Rate of fencing}}\right)$ m = $\left(\frac{9600}{24}\right)$ m = 400 m
Let the length and breadth of the rectangular field be $5x$ and $3x$, respectively.
Perimeter of the rectangular land = $2(5x + 3x) = 16x$
But the perimeter of the given field is 400 m.
∴ $16x = 400$
$x = \left(\frac{400}{16}\right) = 25$
Length of the field = (5×25) m = 125 m
Breadth of the field = (3×25) m = 75 m

Q9

Answer :

Length of the diagonal of the room = $\sqrt{l^2 + b^2 + h^2}$

$= \sqrt{(10)^2 + (10)^2 + (5)^2}$ m

$= \sqrt{100 + 100 + 25}$m

$= \sqrt{225}$m = 15 m

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

Q10

Answer :

Side of the square = 8.5 m

∴ Area of the square = $(\text{Side})^2$

$= (8.5 \text{ m})^2$

$= 72.25 \text{ m}^2$

Q11

Answer :

(i) Diagonal of the square = 72 cm

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

$= \left[\frac{1}{2} \times (72)^2\right] \text{cm}^2$

$= 2592 \text{ cm}^2$

(ii)Diagonal of the square = 2.4 m

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

$= \left[\frac{1}{2} \times (2.4)^2\right] \text{m}^2$

$= 2.88 \text{ m}^2$

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Q12

Answer :

We know:

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

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

= $\left(\sqrt{2 \times 16200}\right)$ m = 180 m

∴ Length of the diagonal of the square = 180 m

Q13

Answer :

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

Given:

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

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

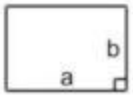
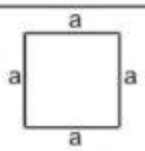
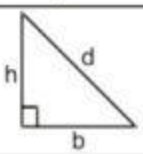
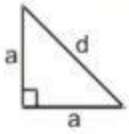
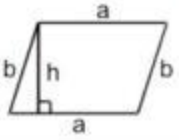
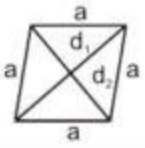
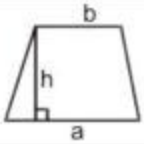
Diagonal of the square = $\sqrt{2 \times \text{Area of } the \text{ square}}$

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

∴ Length of the diagonal of the square field = 100 m

https://www.youtube.com/embed/9Zt0IK7Jmk8?feature=oembedQ14Q15Q16Q17Q18Q19Q20

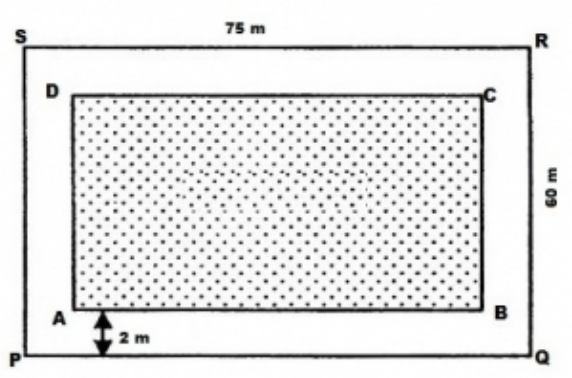
Exercise 20B

Name	Figure	Perimeter	Area
Rectangle		2 (a + b)	ab
Square		4a	a^2
Triangle		a + b + c = 2s	$1 = \frac{1}{2} \times b \times h$ $2 = \sqrt{s(s-a)(s-b)(s-c)}$
Right triangle		b + h + d	$\frac{1}{2}$ bh
Equilateral triangle		3a	1. $\frac{1}{2}$ ah 2. $\frac{\sqrt{3}}{4} a^2$
Isosceles right triangle		2a + d	$\frac{1}{2} a^2$
Parallelogram		2 (a + b)	ah
Rhombus		4a	$\frac{1}{2} d_1 d_2$
Trapezium		Sum of its four sides	$\frac{1}{2}$ h (a + b)
Circle		$2\pi r$	πr^2
Semicircle		$\pi r + 2r$	$\frac{1}{2} \pi r^2$
Ring (shaded region)		----	$\pi (R^2 - r^2)$

Q1

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 × 60) m^2 = 4500 m^2

Width of the path = 2 m

∴ AB = (75 - 2 × 2) m = (75 - 4) m =71 m

AD = (60 - 2 × 2) m = (60 - 4) m = 56 m

Area of rectangle ABCD = (71 x 56) m^2 = 3976 m^2

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

= (4500 - 3976) m^2 = 524 m^2

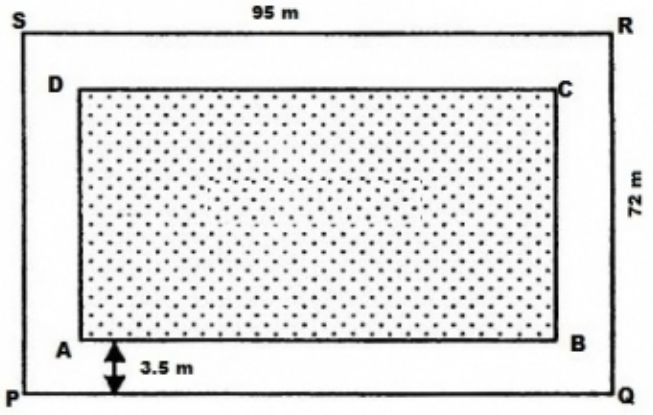
Rate of constructing the path = Rs 125 per m^2

∴ Total cost of constructing the path = Rs (524 × 125) = Rs 65,500

Q2

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 × 72) m^2 = 6,840 m^2

Width of the path = 3.5 m

∴ AB = (95 - 2 × 3.5) m = (95 - 7) m = 88 m

AD = (72 - 2 × 3.5) m = (72 - 7) m = 65 m

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

= (6840 - 5720) m^2 = 1,120 m^2

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

∴ Total cost of constructing the path = Rs. (1,120 × 80) = Rs. 89,600

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

∴ Total cost of laying the grass on the plot = Rs. (5,720 × 40) = Rs. 2,28,800

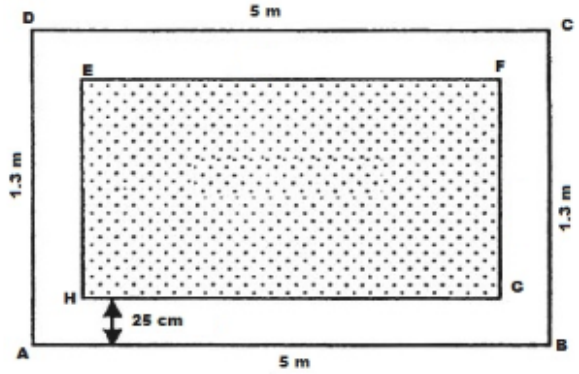
∴ Total expenses involved = Rs. (89,600 + 2,28,800) = Rs. 3,18,400

Q3

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



∴ Area of ABCD = 5 m × 1.3 m = 6.5 m^2

Length, GH = {5 -(0.25 + 0.25} m = 4.5 m
Breadth, FG = {1.3 - 0.25 + 0.25} m = 0.8 m
∴ Area of EFGH = 4.5 m × .8 m = 3.6 m^2

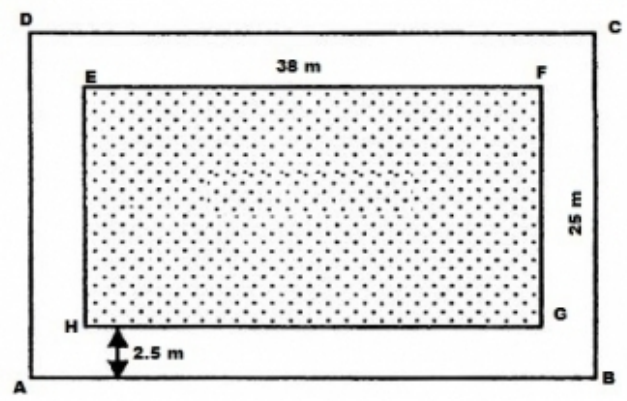
Area of the border = Area of ABCD − Area of EFGH
= 6.5 m^2 − 3.6 m^2
= 2.9 m^2 = 29000 cm^2 [since 1 m^2 = 10000 cm^2]
Rate of printing the border = Rs 1 per 10 cm^2
∴ Total cost of printing the border = Rs $\left(\frac{1\times29000}{10}\right)$
= Rs 2900

Q4

Answer :

Length, EF = 38 m

Breadth, FG = 25 m



∴ Area of EFGH = 38 m × 25 m = 950 m^2

Length, AB = (38 + 2.5 + 2.5) m = 43 m

Breadth, BC = (25 + 2.5 + 2.5) m = 30 m

∴ Area of ABCD = 43 m × 30 m = 1290 m^2

Area of the path = Area of ABCD − Area of PQRS

= 1290 m^2 − 950 m^2

= 340 m^2

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

∴ Total cost of gravelling the path = Rs (120 × 340)

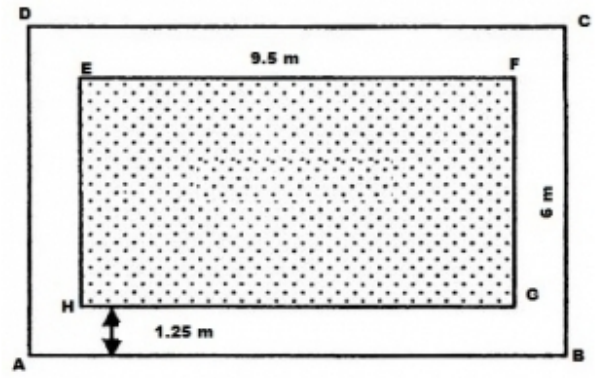
= Rs 40800

Q5

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



∴ Area of EFGH = 9.5 m × 6 m = 57 m^2

Length, AB = (9.5 + 1.25 + 1.25) m = 12 m
Breadth, BC = (6 + 1.25 + 1.25) m = 8.5 m
∴ Area of ABCD = 12 m × 8.5 m = 102 m^2

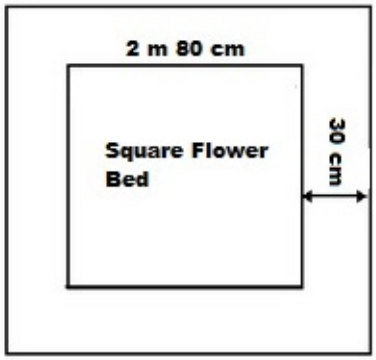
Area of the verandah = Area of ABCD − Area of EFGH
= 102 m^2 − 57 m^2
= 45 m^2
Rate of cementing the verandah = Rs 80 per m^2

∴ Total cost of cementing the verandah = Rs (80 × 45)
= Rs 3600

Q6

Answer :

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



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

Side of the flower bed with the digging strip = 2.80 m + 30 cm + 30 cm

= (2.80 + 0.3 + 0.3) m = 3.4 m

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

∴ Increase in the area of the flower bed = $11.56 \text{ m}^2 - 7.84 \text{ m}^2$

$= 3.72 \text{ m}^2$

Q7

Answer :

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

Perimeter of the park = $2(2x + x) = 240$ m

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

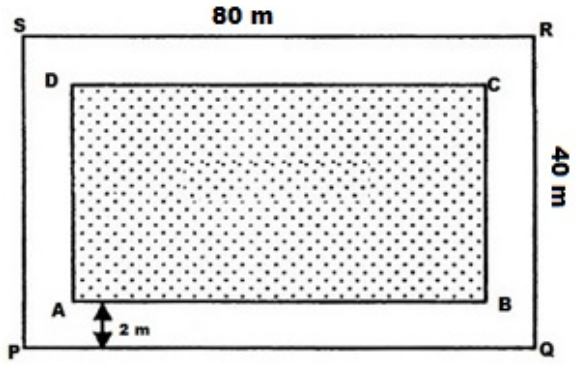
$\Rightarrow 6x = 240$

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

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

Breadth = $x = 40$ 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 = (80×40) m^2 = 3200 m^2

Width of the path = 2 m

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

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

Area of the rectangle ABCD = (76×36) m^2 = 2736 m^2

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

= $(3200 - 2736)$ m^2 = 464 m^2

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

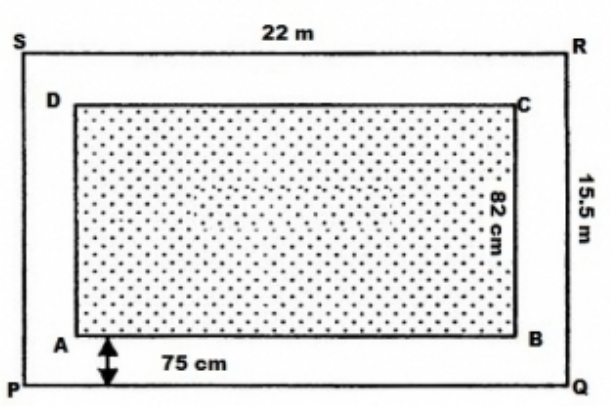
$\therefore$ Total cost of paving the path = Rs. (464×80) = Rs. 37,120

Q8

Answer :

Length of the hall, PQ = 22 m

Breadth of the hall, QR = 15.5 m



∴ Area of the school hall PQRS = 22 m × 15.5 m = 341 m^2

Length of the carpet, AB = 22 m − (0.75 m + 0.75 m) = 20.5 m [since 100 cm = 1 m]

Breadth of the carpet, BC = 15.5 m − (0.75 m + 0.75 m) = 14 m

∴ Area of the carpet ABCD = 20.5 m × 14 m = 287 m^2

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

= 341 m^2 − 287 m^2

= 54 m^2

Area of 1 m length of the carpet = 1 m × 0.82 m = 0.82 m^2

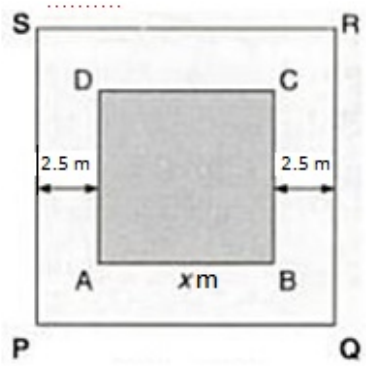
∴ Length of the carpet whose area is 287 m^2 = 287 m^2 ÷ 0.82 m^2 = 350 m

Cost of the 350 m long carpet = Rs 60 × 350 = Rs 21000

Q9

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 m + 2.5 m + 2.5 m) = (x + 5) m

∴ Area of PQRS = $(x + 5)^2 = (x^2 + 10x + 25)$ m^2

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

⇒ $165 = x^2 + 10x + 25 - x^2$

⇒ $165 = 10x + 25$

⇒ $165 - 25 = 10x$

⇒ $140 = 10x$

∴ $x = 140 \div 10 = 14$

∴ Side of the lawn = 14 m

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

Q10

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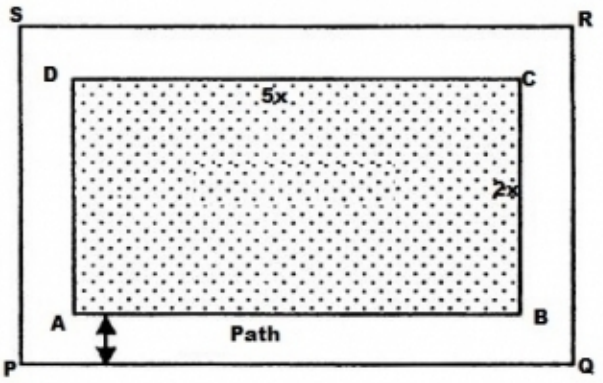
Answer :

Area of the path = 305 m^2



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

∴ Area of the rectangular park = $5x \times 2x = 10x^2$ m^2
Width of the path = 2.5 m
Outer length, *PQ* = 5*x* m + 2.5 m + 2.5 m = (5*x* + 5) m
Outer breadth, *QR* = 2*x* + 2.5 m + 2.5 m = (2*x* + 5) m
Area of *PQRS* = $(5x + 5) \times (2x + 5) = (10x^2 + 25x + 10x + 25) = (10x^2 + 35x + 25)$ m^2
∴ Area of the path = $[(10x^2 + 35x + 25) - 10x^2]$ m^2
⇒ $305 = 35x + 25$
⇒ $305 - 25 = 35x$
⇒ $280 = 35x$
⇒ $x = 280 \div 35 = 8$

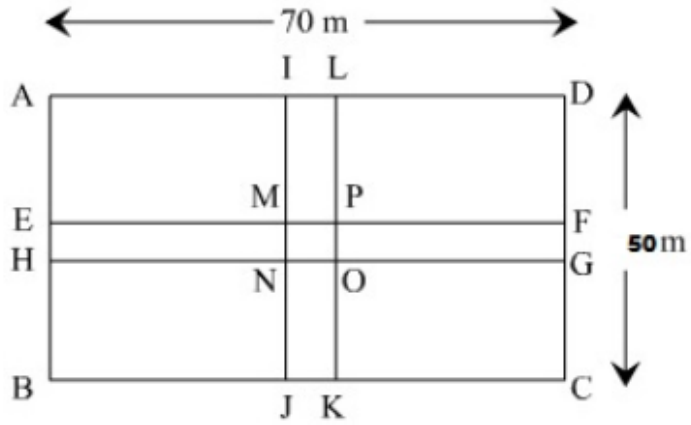
∴ Length of the park = $5x = 5 \times 8 = 40$ m
Breadth of the park = $2x = 2 \times 8 = 16$ m

Q11

Answer :

Let *ABCD* be the rectangular park.

Let *EFGH* and *IJKL* be the two rectangular roads with width 5 m.



Length of the rectangular park, *AD* = 70 m

Breadth of the rectangular park, *CD* = 50 m

∴ Area of the rectangular park = Length × Breadth = 70 m × 50 m = 3500 m^2

Area of road *EFGH* = 70 m × 5 m = 350 m^2

Area of road *IJKL* = 50 m × 5 m = 250 m^2

Clearly, area of *MNOP* is common to both the two roads.

∴ Area of *MNOP* = 5 m × 5 m = 25 m^2

Area of the roads = Area (*EFGH*) + Area (*IJKL*) − Area (*MNOP*)

= (350 + 250) m^2 − 25 m^2 = 575 m^2

It is given that the cost of constructing the roads is Rs. 120/m^2.

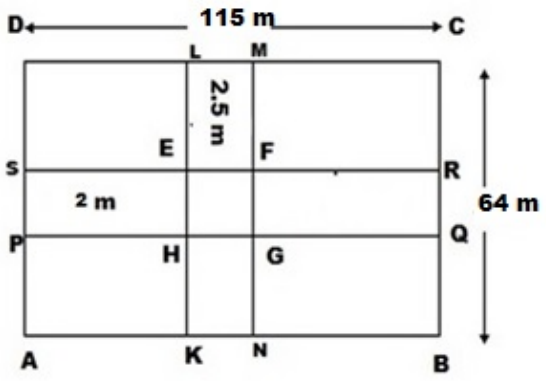
Cost of constructing 575 m^2 area of the roads = Rs. (120 × 575)

= Rs. 69000

Q12

Answer :

Let ABCD be the rectangular field and PQRS and KLMN be the two rectangular roads with width 2 m and 2.5 m, respectively.



Length of the rectangular field, CD = 115 cm
Breadth of the rectangular field, BC = 64 m
∴ Area of the rectangular lawn ABCD = 115 m × 64 m = 7360 m^2
Area of the road PQRS = 115 m × 2 m = 230 m^2
Area of the road KLMN = 64 m × 2.5 m = 160 m^2

Clearly, the area of EFGH is common to both the two roads.

∴ Area of EFGH = 2 m × 2.5 m = 5 m^2

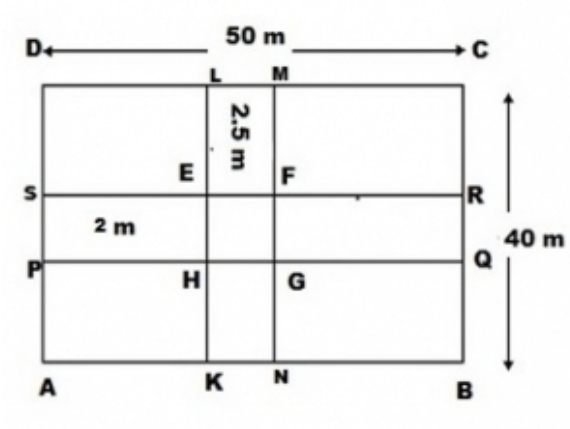
∴ Area of the roads = Area (KLMN) + Area (PQRS) − Area (EFGH)
= (230 m^2 + 160 m^2) − 5 m^2 = 385 m^2

Rate of gravelling the roads = Rs 60 per m^2
∴ Total cost of gravelling the roads = Rs (385 × 60)
= Rs 23,100

Q13

Answer :

Let ABCD be the rectangular field and KLMN and PQRS be the two rectangular roads with width 2.5 m and 2 m, respectively.



Length of the rectangular field CD = 50 cm
Breadth of the rectangular field BC = 40 m
∴ Area of the rectangular field ABCD = 50 m × 40 m = 2000 m^2
Area of road KLMN = 40 m × 2.5 m = 100 m^2
Area of road PQRS = 50 m × 2 m = 100 m^2

Clearly, area of EFGH is common to both the two roads.

∴ Area of EFGH = 2.5 m × 2 m = 5 m^2

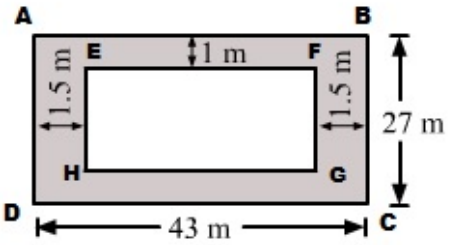
∴ Area of the roads = Area (KLMN) + Area (PQRS) − Area (EFGH)
= (100 m^2 + 100 m^2) − 5 m^2 = 195 m^2

Area of the remaining portion of the field = Area of the rectangular field (ABCD) − Area of the roads
= (2000 − 195) m^2
= 1805 m^2

Q14

Answer :

(i) Complete the rectangle as shown below:



Area of the shaded region = [Area of rectangle ABCD - Area of rectangle EFGH] sq. units

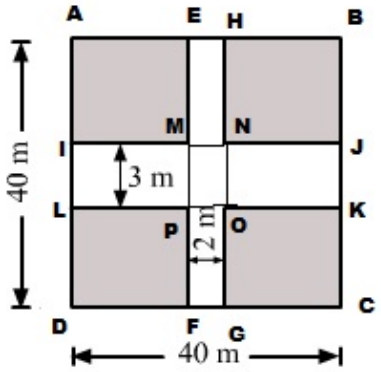
$= [(43 \text{ m} \times 27 \text{ m}) - \{(43 - 2 \times 1.5) \text{ m} \times (27 - 1 \times 2) \text{ m}\}]$

$= [(43 \text{ m} \times 27 \text{ m}) - \{40 \text{ m} \times 25 \text{ m}\}]$

$= 1161 \text{ m}^2 - 1000 \text{ m}^2$

$= 161 \text{ m}^2$

(ii) Complete the rectangle as shown below:



Area of the shaded region = [Area of square ABCD - {(Area of EFGH) + (Area of IJKL) - (Area of MNOP)}] sq. units

$= [(40 \times 40) - \{(40 \times 2) + (40 \times 3) - (2 \times 3)\}] \text{ m}^2$

$= [1600 - \{(80 + 120 - 6)\}] \text{ m}^2$

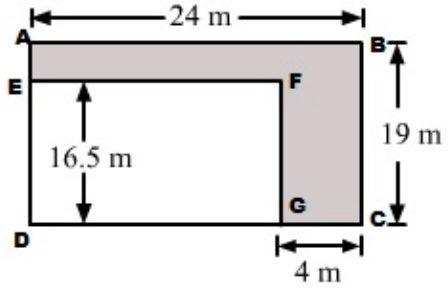
$= [1600 - 194] \text{ m}^2$

$= 1406 \text{ m}^2$

Q15

Answer :

(i) Complete the rectangle as shown below:



Area of the shaded region = [Area of rectangle ABCD - Area of rectangle EFGD] sq. units

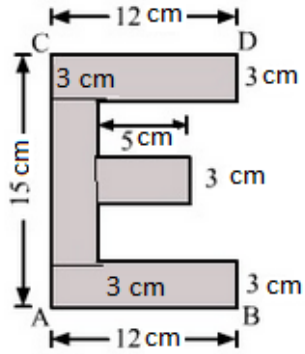
$= [(AB \times BC) - (DG \times GF)]\ m^2$

$= [(24\ m \times 19\ m) - \{(24 - 4)\ m \times 16.5\ m\}]$

$= [(24\ m \times 19\ m) - (20\ m \times 16.5)\ m]$

$= (456 - 330)\ m^2 = 126\ m^2$

(ii) Complete the rectangle by drawing lines as shown below:



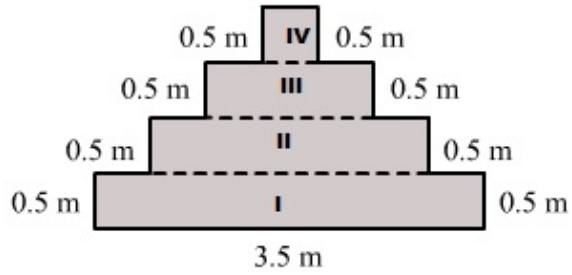
Area of the shaded region $= \{(12 \times 3) + (12 \times 3) + (5 \times 3) + \{(15 - 3 - 3) \times 3)\}\ cm^2$

$= \{36 + 36 + 15 + 27\}\ cm^2$

$= 114\ cm^2$

Q16

Divide the given figure in four parts shown below:



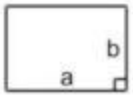
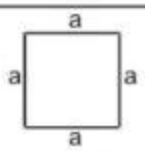
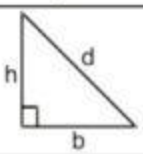
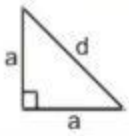
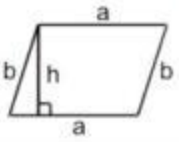
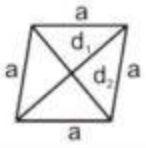
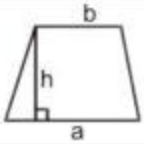
Given:
Width of each part = 0.5 m

Now, we have to find the length of each part.

Length of part I = 3.5 m
Length of part II = (3.5 - 0.5 - 0.5) m = 2.5 m
Length of part III = (2.5 - 0.5 - 0.5) = 1.5 m
Length of part IV = (1.5 - 0.5 - 0.5) = 0.5 m
∴ Area of the shaded region = [Area of part (I) + Area of part (II) + Area of part (III) + Area of part (IV)] sq. units

$= [(3.5 \times 0.5) + (2.5 \times 0.5) + (1.5 \times 0.5) + (0.5 \times 0.5)]\ m^2$
$= [1.75 + 1.25 + 0.75 + 0.25]\ m^2$
$= 4\ m^2$

Exercise 20C

Name	Figure	Perimeter	Area
Rectangle		2 (a + b)	ab
Square		4a	a^2
Triangle		a + b + c = 2s	$1 = \frac{1}{2} \times b \times h$ $2 = \sqrt{s(s-a)(s-b)(s-c)}$
Right triangle		b + h + d	$\frac{1}{2}$ bh
Equilateral triangle		3a	1. $\frac{1}{2}$ ah 2. $\frac{\sqrt{3}}{4} a^2$
Isosceles right triangle		2a + d	$\frac{1}{2} a^2$
Parallelogram		2 (a + b)	ah
Rhombus		4a	$\frac{1}{2} d_1 d_2$
Trapezium		Sum of its four sides	$\frac{1}{2}$ h (a + b)
Circle		$2\pi r$	πr^2
Semicircle		$\pi r + 2r$	$\frac{1}{2} \pi r^2$
Ring (shaded region)		----	$\pi (R^2 - r^2)$

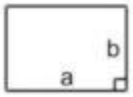
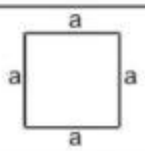
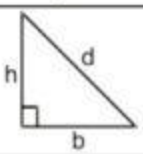
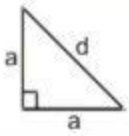
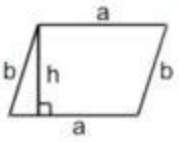
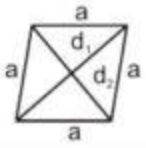
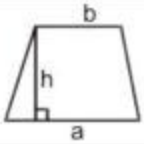
Q1

Answer :

Base = 32 cm
Height = 16.5 cm

∴ Area of the parallelogram = Base × Height
= 32 cm × 16.5 cm
= 528 cm^2

Exercise 20D

Name	Figure	Perimeter	Area
Rectangle		2 (a + b)	ab
Square		4a	a^2
Triangle		a + b + c = 2s	$1 = \frac{1}{2} \times b \times h$ $2 = \sqrt{s(s-a)(s-b)(s-c)}$
Right triangle		b + h + d	$\frac{1}{2}$ bh
Equilateral triangle		3a	1. $\frac{1}{2}$ ah 2. $\frac{\sqrt{3}}{4} a^2$
Isosceles right triangle		2a + d	$\frac{1}{2} a^2$
Parallelogram		2 (a + b)	ah
Rhombus		4a	$\frac{1}{2} d_1 d_2$
Trapezium		Sum of its four sides	$\frac{1}{2}$ h (a + b)
Circle		$2\pi r$	πr^2
Semicircle		$\pi r + 2r$	$\frac{1}{2} \pi r^2$
Ring (shaded region)		----	$\pi (R^2 - r^2)$

Q1

Answer :

We know:

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

(i) Base = 42 cm

Height = 25 cm

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

(ii) Base = 16.8 m

Height = 75 cm = 0.75 m [since 100 cm = 1 m]

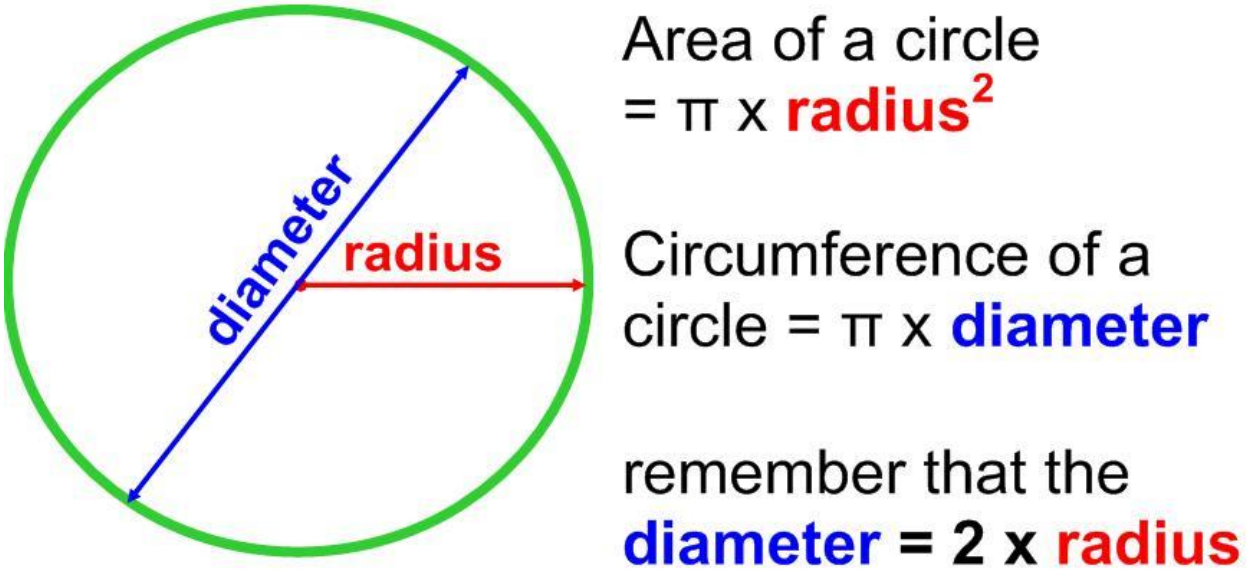
$\therefore$ Area of the triangle = $\left(\frac{1}{2} \times 16.8 \times 0.75\right)$ m^2 = 6.3 m^2

(iii) Base = 8 dm = (8 × 10) cm = 80 cm [since 1 dm = 10 cm]

Height = 35 cm

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

Exercise 20E



https://www.youtube.com/embed/O-cawByg2aA?feature=oembed

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-7-maths-chapter-20-mensuration/

Q1

Answer :

Here, r = 15 cm

∴ Circumference = $2\pi r$

= (2 × 3.14 × 15) cm

= 94.2 cm

Hence, the circumference of the given circle is 94.2 cm

Q2

Answer :

(i) Here, r = 28 cm

∴ Circumference = 2π r

$= \left(2 \times \frac{22}{7} \times 28\right)$ cm

= 176 cm

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

(ii) Here, r = 1.4 m

∴ Circumference = 2π r

$= \left(2 \times \frac{22}{7} \times 1.4\right)$ m

$= (2 \times 22 \times 0.2)$ m = 8.8 m

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

Q3

Answer :

(i) Here, d = 35 cm

Circumference = 2π r

= (πd) [since $2r = d$]

= $\left(\frac{22}{7} \times 35\right)$ cm = (22 × 5) = 110 cm

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

(ii) Here, d = 4.9 m

Circumference =2π r

= (πd) [since $2r = d$]

= $\left(\frac{22}{7} \times 4.9\right)$ m = (22 × 0.7) = 15.4 m

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

Q4

Answer :

Circumference of the given circle = 57.2 cm

∴ C = 57.2 cm

Let the radius of the given circle be r cm.

C = $2\pi r$

⇒ $r = \frac{C}{2\pi}$ cm

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

Thus, radius of the given circle is 9.1 cm.

Q5

Answer :

Circumference of the given circle = 63.8 m

∴ C = 63.8 m

Let the radius of the given circle be *r* cm.

C = $2\pi r$

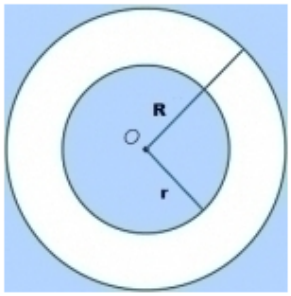
⇒ *r* = $\frac{C}{2\pi}$

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

∴ Diameter of the given circle = 2*r* = (2 × 10.15) m = 20.3 m

Answer :

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



Then, $2\pi r$ = 528

$2\pi R$ = 616

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

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

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

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

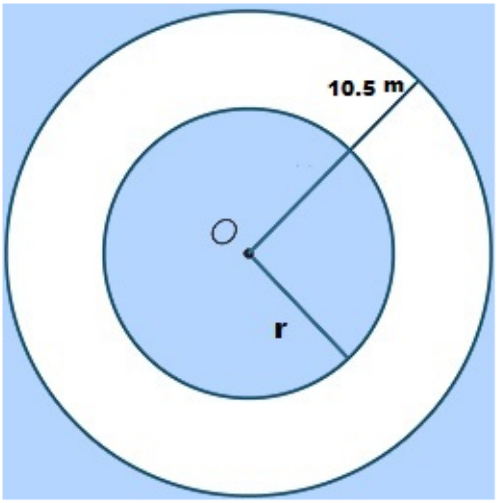
⇒ (*R* - *r*) = (98 - 84) m = 14 m

Hence, the width of the track is 14 m.

Q10

Answer :

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



Inner circumference = 330 m

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

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

Inner radius of the track = 52.5 m

∴ Outer radii of the track = (52.5 + 10.5) m = 63 m

∴ 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

∴ Total cost of fencing the outer circle = Rs. (396 × 20) = Rs. 7920

Q11

Answer :

We know that the concentric circles are circles that form within each other, around a common centre point.

Radius of the inner circle, r = 98 cm

∴ Circumference of the inner circle = $2\pi r$

$= \left(2 \times \frac{22}{7} \times 98\right)$ cm = 616 cm

Radius of the outer circle, R = 1 m 26 cm = 126 cm [since 1 m = 100 cm]

∴ Circumference of the outer circle = $2\pi R$

$= \left(2 \times \frac{22}{7} \times 126\right)$ cm = 792 cm

∴ Difference in the lengths of the circumference of the circles = (792 - 616) cm = 176 cm

Hence, the circumference of the second circle is 176 cm larger than that of the first circle.

Q12

Answer :

Length of the wire = Perimeter of the equilateral triangle

= 3 × Side of the equilateral triangle = (3 × 8.8) cm = 26.4 cm

Let the wire be bent into the form of a circle of radius r cm.

Circumference of the circle = 26.4 cm

$\Rightarrow 2\pi r = 26.4$

$\Rightarrow 2 \times \frac{22}{7} \times r = 26.4$

$\Rightarrow r = \left(\frac{26.4 \times 7}{2 \times 22}\right)$ cm = 4.2 cm

∴ Diameter = $2r$ = (2 × 4.2) cm = 8.4 cm

Hence, the diameter of the ring is 8.4 cm.

Q13

Answer :

Circumference of the circle = Perimeter of the rhombus

= 4 × Side of the rhombus = (4 × 33) cm = 132 cm

∴ Circumference of the circle = 132 cm

$\Rightarrow 2\pi r = 132$

$\Rightarrow 2 \times \frac{22}{7} \times r = 132$

$\Rightarrow r = \left(\frac{132 \times 7}{2 \times 22}\right)$ cm = 21 cm

Hence, the radius of the circle is 21 cm.

Q14

Answer :

Length of the wire = Perimeter of the rectangle

= 2(*l* + *b*) = 2 × (18.7 + 14.3) cm = 66 cm

Let the wire be bent into the form of a circle of radius *r* cm.

Circumference of the circle = 66 cm

$\Rightarrow 2\pi r = 66$

$\Rightarrow \left(2 \times \frac{22}{7} \times r\right) = 66$

$\Rightarrow r = \left(\frac{66 \times 7}{2 \times 22}\right)$ cm = 10.5 cm

Hence, the radius of the circle formed is 10.5 cm.

Q15

Answer :

It is given that the radius of the circle is 35 cm.

Length of the wire = Circumference of the circle

$\Rightarrow$ Circumference of the circle $= 2\pi r = \left(2 \times \frac{22}{7} \times 35\right)$ cm = 220 cm

Let the wire be bent into the form of a square of side *a* cm.

Perimeter of the square = 220 cm

$\Rightarrow 4a = 220$

$\Rightarrow a = \left(\frac{220}{4}\right)$ cm = 55 cm

Hence, each side of the square will be 55 cm.

Q16

Answer :

Length of the hour hand (r)= 4.2 cm.

Distance covered by the hour hand in 12 hours = $2\pi r = \left(2 \times \frac{22}{7} \times 4.2\right)$ cm = 26.4 cm

$\therefore$ Distance covered by the hour hand in 24 hours = (2 × 26.4) = 52.8 cm

Length of the minute hand (R)= 7 cm

Distance covered by the minute hand in 1 hour = $2\pi R = \left(2 \times \frac{22}{7} \times 7\right)$ cm = 44 cm

$\therefore$ Distance covered by the minute hand in 24 hours = (44 × 24) cm = 1056 cm

$\therefore$ Sum of the distances covered by the tips of both the hands in 1 day = (52.8 + 1056) cm

= 1108.8 cm

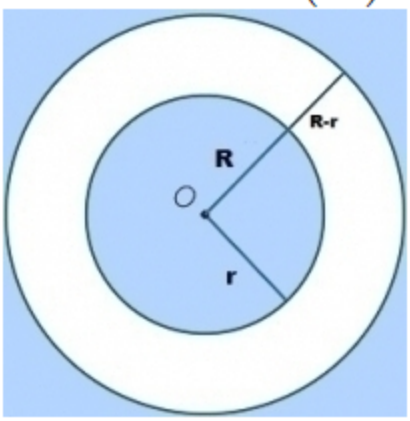
Q17

Answer :

Given:

Diameter of the well (d) = 140 cm.

Radius of the well (r) = $\left(\frac{140}{2}\right)$cm = 70 cm



Let the radius of the outer circle (including the stone parapet) be R cm.

Length of the outer edge of the parapet = 616 cm

$\Rightarrow 2\pi R = 616$

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

$\Rightarrow R = \left(\frac{616 \times 7}{2 \times 22}\right)$ cm = 98 cm

Now, width of the parapet = {Radius of the outer circle (including the stone parapet) - Radius of the well}

= {98 -70} cm = 28 cm

Hence, the width of the parapet is 28 cm.

Q18

Answer :

It may be noted that in one rotation, the bus covers a distance equal to the circumference of the wheel.
Now, diameter of the wheel = 98 cm

∴ Circumference of the wheel = $\pi d = \left(\frac{22}{7} \times 98\right)$ cm = 308 cm

Thus, the bus travels 308 cm in one rotation.

∴ Distance covered by the bus in 2000 rotations = (308 × 2000) cm
= 616000 cm
= 6160 m [since 1 m = 100 cm]

Q19

Answer :

It may be noted that in one revolution, the cycle covers a distance equal to the circumference of the wheel.
Diameter of the wheel = 70 cm

∴ Circumference of the wheel = $\pi d = \left(\frac{22}{7} \times 70\right)$ cm = 220 cm

Thus, the cycle covers 220 cm in one revolution.

∴ Distance covered by the cycle in 250 revolutions = (220 × 250) cm
= 55000 cm
= 550 m [since 1 m = 100 cm]

Hence, the cycle will cover 550 m in 250 revolutions.

Q20

Answer :

Diameter of the wheel = 77 cm

⇒ Radius of the wheel = $\left(\frac{77}{2}\right)$ cm

Circumference of the wheel = $2\pi r$

$= \left(2 \times \frac{22}{7} \times \frac{77}{2}\right)$ cm = (22 × 11) cm = 242 cm

$= \left(\frac{242}{100}\right)$ m = $\left(\frac{121}{50}\right)$ m

Distance covered by the wheel in 1 revolution = $\left(\frac{121}{50}\right)$ m

Now, $\left(\frac{121}{50}\right)$ m is covered by the car in 1 revolution.

(121 × 1000) m will be covered by the car in $\left(1 \times \frac{50}{121} \times 121 \times 1000\right)$ revolutions, i.e. 50000 revolutions.

∴ Required number of revolutions = 50000

Q21

Answer :

It may be noted that in one revolution, the bicycle covers a distance equal to the circumference of the wheel.

Total distance covered by the bicycle in 5000 revolutions = 11 km

⇒ 5000 × Circumference of the wheel = 11000 m [since 1 km = 1000 m]

Circumference of the wheel = $\left(\frac{11000}{5000}\right)$ m =2.2 m = 220 cm [since 1 m = 100 cm]

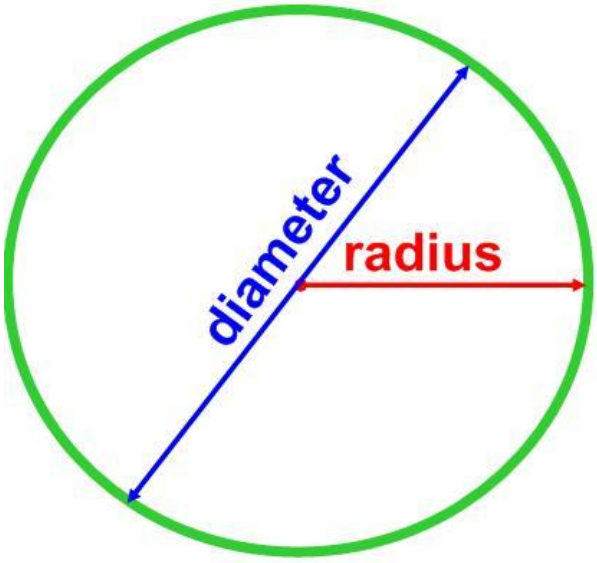
Circumference of the wheel = $\pi \times \text{Diameter of the wheel}$

⇒ 220 cm = $\frac{22}{7} \times \text{Diameter of the wheel}$

⇒ Diameter of the wheel = $\left(\frac{220 \times 7}{22}\right)$ cm = 70 cm

Hence, the circumference of the wheel is 220 cm and its diameter is 70 cm.

Exercise 20F



Area of a circle
= π x radius^2

Circumference of a circle = π x diameter

remember that the
diameter = 2 x radius

https://www.youtube.com/embed/O-cawByg2aA?feature=oembed

Q1

Answer :

(i) Given:
$r = 21$ cm

∴ Area of the circle = (πr^2) sq. units

$= \left(\frac{22}{7} \times 21 \times 21\right)$ cm^2 = $(22 \times 3 \times 21)$ cm^2 = 1386 cm^2

(ii) Given:
$r = 3.5$ m

Area of the circle = (πr^2) sq. units

$= \left(\frac{22}{7} \times 3.5 \times 3.5\right)$ m^2 = $(22 \times 0.5 \times 3.5)$ m^2 = 38.5 m^2

https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-7-maths-chapter-20-mensuration/

Q2

Answer :

(i) Given:

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

Area of the circle = (πr^2) sq. units

$= \left(\frac{22}{7} \times 14 \times 14\right)$ cm^2 = $(22 \times 2 \times 14)$ cm^2 = 616 cm^2

(ii) Given:

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

Area of the circle = (πr^2) sq. units

$= \left(\frac{22}{7} \times 0.7 \times 0.7\right)$ m^2 = $(22 \times 0.1 \times 0.7)$ m^2 = 1.54 m^2

Q3

Answer :

Let the radius of the circle be r cm.

Circumference = $(2\pi r)$cm

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

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

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

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

$= \left(\frac{22}{7} \times 42 \times 42\right)$ cm^2

= 5544 cm^2

Q4

Answer :

Let the radius of the circle be *r* m.

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

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

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

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

$\therefore$ Area of the circle $= \pi r^2$

$= \left(\frac{22}{7} \times 5.6 \times 5.6\right)$ m^2 = 98.56 m^2

Q5

Answer :

Let the radius of the circle be *r* cm.

Then, its area will be πr^2 cm^2.

$\therefore \pi r^2 = 616$

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

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

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

$\Rightarrow$ Circumference of the circle $= (2\pi r)$ cm

$= \left(2 \times \frac{22}{7} \times 14\right)$ cm = 88 cm

Q6

Answer :

Let the radius of the circle be *r* m.
Then, area = πr^2 m^2
$\therefore \pi r^2 = 1386$
$\Rightarrow \left(\frac{22}{7} \times r \times r\right) = 1386$
$\Rightarrow r^2 = \left(\frac{1386 \times 7}{22}\right) = 441$
$\Rightarrow r = \sqrt{441} = 21$
$\Rightarrow$ Circumference of the circle = $(2\pi r)$ m
$= \left(2 \times \frac{22}{7} \times 21\right)$ m = 132 m

Q7

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.

Q8

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

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

Q9

Answer :

Let a be one side of the square.

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

$\Rightarrow a^2 = 121$

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

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

Length of the wire = Perimeter of the square

= 44 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

$\Rightarrow 2\pi r = 44$

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

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

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

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

= 154 cm^2

Q10

Answer :

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

Length of the wire = Circumference of the circle

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

Let the wire be bent into the form of a square of side *a* cm.

Perimeter of the square = 176 cm

$\Rightarrow 4a = 176$

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

Q11

Answer :

Area of the acrylic sheet = 34 cm $\times$ 24 cm = 816 cm^2

Given that the diameter of a circular button is 3.5 cm.

$\therefore$ Radius of the circular button (r)= $\left(\frac{3.5}{2}\right)$ cm = 1.75 cm

$\therefore$ Area of 1 circular button = πr^2

$= \left(\frac{22}{7} \times 1.75 \times 1.75\right) \text{ cm}^2$

$= 9.625 \text{ cm}^2$

$\therefore$ Area of 64 such buttons = $(64 \times 9.625) \text{ cm}^2 = 616 \text{ cm}^2$

Area of the remaining acrylic sheet = (Area of the acrylic sheet - Area of 64 circular buttons)

$= (816 - 616) \text{ cm}^2 = 200 \text{ cm}^2$

Q12

Answer :

Area of the rectangular ground = 90 m × 32 m = (90 × 32) m^2 = 2880 m^2

Given:

Radius of the circular tank (r) = 14 m

∴ Area covered by the circular tank = $\pi r^2 = \left(\frac{22}{7} \times 14 \times 14\right)$ m^2

= 616 m^2

∴ Remaining portion of the rectangular ground for turfing = (Area of the rectangular ground - Area covered by the circular tank)

= (2880 - 616) m^2 = 2264 m^2

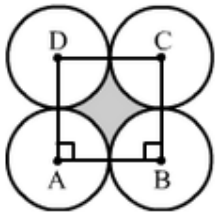
Rate of turfing = Rs 50 per sq. metre

∴ Total cost of turfing the remaining ground = Rs (50 × 2264) = Rs 1,13,200

Q13

Answer :

Area of each of the four quadrants is equal to each other with radius 7 cm.



Area of the square ABCD = $(Side)^2$ = $(14\ cm)^2$ = 196 cm^2

Sum of the areas of the four quadrants = $\left(4 \times \frac{1}{4} \times \frac{22}{7} \times 7 \times 7\right)$ cm^2

= 154 cm^2

∴ Area of the shaded portion = Area of square ABCD - Areas of the four quadrants

= (196 - 154) cm^2

= 42 cm^2

Q14

Answer :

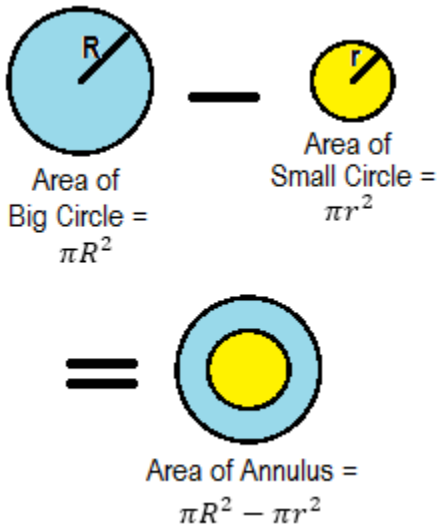
Let ABCD be the rectangular field.

Here, AB = 60 m
BC = 40 m

Let the horse be tethered to corner A by a 14 m long rope.

Then, it can graze through a quadrant of a circle of radius 14 m.
∴ Required area of the field = $\left(\frac{1}{4} \times \frac{22}{7} \times 14 \times 14\right)$ m^2 = 154 m^2
Hence, horse can graze 154 m^2 area of the rectangular field.

https://www.youtube.com/embed/m3dwUx5pXj8?feature=oembed



Q15

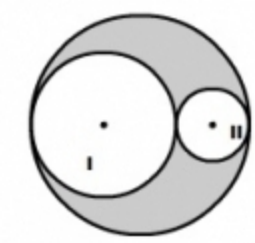
Answer :

Diameter of the big circle = 21 cm

Radius = $\left(\frac{21}{2}\right)$ cm = 10.5 cm

∴ Area of the bigger circle = $\pi r^2 = \left(\frac{22}{7} \times 10.5 \times 10.5\right)$ cm^2

= 346.5 cm^2



Diameter of circle I = $\frac{2}{3}$ of the diameter of the bigger circle

= $\frac{2}{3}$ of 21 cm = $\left(\frac{2}{3} \times 21\right)$ cm = 14 cm

Radius of circle I (r_1) = $\left(\frac{14}{2}\right)$ cm = 7 cm

∴ Area of circle I = $\pi {r_1}^2 = \left(\frac{22}{7} \times 7 \times 7\right)$ cm^2

= 154 cm^2

Diameter of circle II = $\frac{1}{3}$ of the diameter of the bigger circle

= $\frac{1}{3}$ of 21 cm = $\left(\frac{1}{3} \times 21\right)$ cm = 7 cm

Radius of circle II (r_2) = $\left(\frac{7}{2}\right)$ cm = 3.5 cm

∴ Area of circle II = $\pi {r_2}^2 = \left(\frac{22}{7} \times 3.5 \times 3.5\right)$ cm^2

= 38.5 cm^2

∴ Area of the shaded portion = {Area of the bigger circle - (Sum of the areas of circle I and II)}

= {346.5 - (154 + 38.5)} cm^2

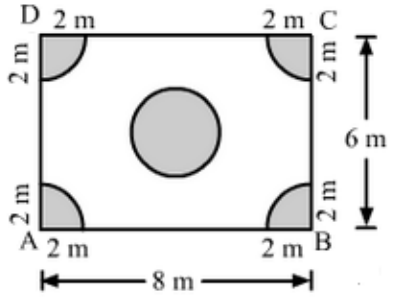
= {346.5 - 192.5} cm^2

= 154 cm^2

Hence, the area of the shaded portion is 154 cm^2

Q16

Answer :



Let ABCD be the rectangular plot of land that measures 8 m by 6 m.

$\therefore$ Area of the plot = (8 m $\times$ 6 m) = 48 m^2

Area of the four flower beds = $\left(4 \times \frac{1}{4} \times \frac{22}{7} \times 2 \times 2\right)$ m^2 = $\left(\frac{88}{7}\right)$ m^2

Area of the circular flower bed in the middle of the plot = πr^2

$= \left(\frac{22}{7} \times 2 \times 2\right)$ m^2 = $\left(\frac{88}{7}\right)$ m^2

Area of the remaining part = $\left\{48 - \left(\frac{88}{7} + \frac{88}{7}\right)\right\}$ m^2

$= \left\{48 - \frac{176}{7}\right\}$ m^2

$= \left\{\frac{336-176}{7}\right\}$ m^2 = $\left(\frac{160}{7}\right)$ m^2 = 22.86 m^2

$\therefore$ Required area of the remaining plot = 22.86 m^2

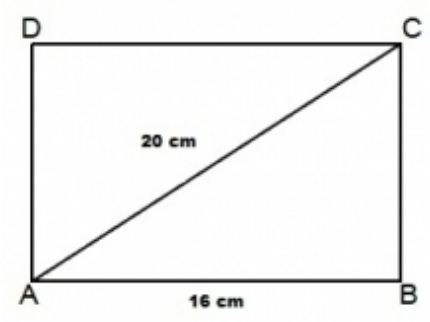
Exercise 20G

Q1

Answer :

(c) 192 cm^2

Let ABCD be the rectangular plot.
Then, AB = 16 cm
AC = 20 cm



Let BC = x cm
From right triangle ABC:
$AC^2 = AB^2 + BC^2$
$\Rightarrow (20)^2 = (16)^2 + x^2$
$\Rightarrow x^2 = (20)^2 - (16)^2 \Rightarrow \{400 - 256\} = 144$
$\Rightarrow x = \sqrt{144} = 12$
$\therefore$ BC = 12 cm
$\therefore$ Area of the plot = (16 × 12) cm^2 = 192 cm^2

Q30

IndCareer

Answer :

(c) 17.60 m

Let the radius of the circle be *r* m.
Area = πr^2 m^2
$\therefore \pi r^2 = 24.64$
$\Rightarrow \left(\frac{22}{7} \times r \times r\right) = 24.64$
$\Rightarrow r^2 = \left(\frac{24.64 \times 7}{22}\right) = 7.84$
$\Rightarrow r = \sqrt{7.84} = 2.8$ m
$\Rightarrow$ Circumference of the circle = $(2\pi r)$ m
$= \left(2 \times \frac{22}{7} \times 2.8\right)$ m = 17.60 m

Q31

Answer :

(c) 3 cm

Suppose the radius of the original circle is *r* cm.
Area of the original circle = πr^2

Radius of the circle = (*r* +1) cm
According to the question:
$\pi(r+1)^2 = \pi r^2 + 22$
$\Rightarrow \pi\left(r^2 + 1 + 2r\right) = \pi r^2 + 22$
$\Rightarrow \pi r^2 + \pi + 2\pi r = \pi r^2 + 22$
$\Rightarrow \pi + 2\pi r = 22$ [cancel πr^2 from both the sides of the equation]
$\Rightarrow \pi(1 + 2r) = 22$
$\Rightarrow (1 + 2r) = \frac{22}{\pi} = \left(\frac{22 \times 7}{22}\right) = 7$
$\Rightarrow 2r = 7 - 1 = 6$
$\therefore r = \left(\frac{6}{2}\right)$ cm = 3 cm
$\therefore$ Original radius of the circle = 3 cm

Q32

Answer :

(c) 1000

Radius of the wheel = 1.75 m

Circumference of the wheel = $2\pi r$

$= \left(2 \times \frac{22}{7} \times 1.75\right)$ cm = (2 × 22 × 0.25) m = 11 m

Distance covered by the wheel in 1 revolution is 11 m.

Now, 11 m is covered by the car in 1 revolution.

(11 × 1000) m will be covered by the car in $\left(1 \times \frac{1}{11} \times 11 \times 1000\right)$ revolutions, i.e. 1000 revolutions.

∴ Required number of revolutions = 1000

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