Question:1

Find the area of the rectangle whose dimensions are:

i length = 24.5 m, breadth = 18 m

ii length = 12.5 m, breadth - 8 dm.

Solution:

i Length = 24.5 m

Breadth = 18 m

∴ Area of the rectangle = Length $\times$ Breadth

= 24.5 m $\times$ 18 m

= 441 m^2

ii Length = 12.5 m

Breadth = 8 dm = (8 $\times$ 10) = 80 cm = 0.8 m

$$since 1dm = 10cm and 1m = 100cm$$

∴ Area of the rectangle = Length $\times$ Breadth

= 12.5 m $\times$ 0.8 m

= 10 m^2

Question:2

Find the area of a rectangular plot, one side of which is 48 m and its diagonal is 50 m.

Solution:

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:

$Hypotenuse^2 = Base^2 + Perpendicular^2$

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

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

∴ Other side of the rectangular plot = 14 m

Length = 48m

Breadth = 14m

∴ Area of the rectangular plot = 48 m $\times$ 14 m = 672 m^2

Hence, the area of a rectangular plot is 672 m^2.

Question:3

The sides of a rectangular park are in the ratio 4 : 3. If its area is 1728 m^2, find the cost of fencing it at Rs 30 per metre.

Solution:

Let the length of the field be $4x$ m.

Breadth = $3x$ m

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

But it is given that the area is 1728 m^2.

$\therefore 12x^2 = 1728$

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

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

$\therefore$ Length = (4×12) m = 48 m

Breadth = (3×12) m =36 m

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

$= 248 + 36$ m = (2×84) m = 168 m

$\therefore$ Cost of fencing = Rs (168×30) = Rs 5040

Question:4

The area of a rectangular field is 3584 m^2 and its length is 64 m. A boy runs around the field at the rate of 6 km/h. How long will he take to go 5 times around it?

Solution:

Area of the rectangular field = 3584 m^2

Length of the rectangular field = 64 m

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

Perimeter of the rectangular field = $2\ length + breadth$

$= 264 + 56$ m = (2×120) m = 240 m

Distance covered by the boy = $5 \times$ Perimeter of the rectangular field

$= 5 \times 240 = 1200$ m

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

or

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

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

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

Question:5

A verandah is 40 m long and 15 m broad. It is to be paved with stones, each measuring 6 dm by 5 dm. Find the number of stones required.

Solution:

Given:

Length of the verandah = 40 m = 400 dm

$$since 1m = 10dm$$

Breadth of the verandah = 15 m = 150 dm

∴ Area of the verandah= (400 $\times$ 150) dm^2 = 60000 dm^2

Length of a stone = 6 dm

Breadth of a stone = 5 dm

∴ Area of a stone = (6 $\times$ 5) dm^2 = 30 dm^2

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

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

Question:6

Find the cost of carpeting a room 13 m by 9 m with a carpet of width 75 cm at the rate of Rs 105 per metre.

Solution:

Area of the carpet = Area of the room

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

Now, width of the carpet = 75 cm $\quad given$

= 0.75 m

$$since 1m = 100cm$$

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 $\times$105) = Rs 16380

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

Question:7

The cost of carpeting a room 15 m long with a carpet of width 75 cm at Rs 80 per metre is Rs 19200. Find the width of the room.

Solution:

Given:

Length of the room = 15 m

Width of the carpet = 75 cm = 0.75 m $\quad since 1m = 100cm$

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

Cost of the carpet = Rs. 80 per m

$\therefore$ Cost of x m carpet = Rs. $(80 \times x)$ = 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 $\times$ 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 $\times$ b m = $15b\ m^2$

$\therefore 15b\ m^2 = 180\ m^2$

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

Hence, the width of the room is 12 m.

Question:8

The length and breadth of a rectangular piece of land are in the ratio of 5 : 3. If the total cost of fencing it at Rs 24 per metre is Rs 9600, find its length and breadth.

Solution:

Total cost of fencing a rectangular piece = Rs. 9600

Rate of fencing = Rs. 24

$\therefore$ 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.

$\therefore 16x = 400$

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

Length of the field = (5×25) m = 125 m

Breadth of the field = (3×25) m = 75 m

Question:9

Find the length of the largest pole that can be placed in a hall 10 m long, 10 m wide and 5 m high.

Solution:

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

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

Question:10

Find the area of a square each of whose sides measures 8.5 m.

Solution:

Side of the square = 8.5 m

∴ Area of the square = $Side^2$

= $8.5m^2$

= 72.25 m^2

Question:11

Find the area of the square, the length of whose diagonal is

i 72 cm

ii 2.4 m

Solution:

i Diagonal of the square = 72 cm

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

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

= 2592 cm^2

iiDiagonal of the square = 2.4 m

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

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

= 2.88 m^2

Question:12

The area of a square is 16200 m^2. Find the length of its diagonal.

Solution:

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

Question:13

The area of a square field is $\frac{1}{2}$ hectare. Find the length of its diagonal in metres.

Solution:

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

Question:14

The area of a square plot is 6084 m^2. Find the length of the wire which can go four times along the boundary of the plot.

Solution:

Area of the square plot = 6084 m^2

Side of the square plot = $\left(\sqrt{\text{Area}}\right)$

= $\left(\sqrt{6084}\right)$ m

= $\left(\sqrt{78 \times 78}\right)$ m = 78 m

∴ Perimeter of the square plot = 4 × side = (4 × 78) m = 312 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 $\times$ Perimeter of the square plot

= (4 $\times$ 312) m = 1248 m

Question:15

A wire is in the shape of a square of side 10 cm. If the wire is rebent into a rectangle of length 12 cm, find its breadth. Which figure encloses more area and by how much?

Solution:

Side of the square = 10 cm

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

Length of the rectangle (l) = 12 cm

Let b be the breadth of the rectangle.

Perimeter of the rectangle = Perimeter of the square

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

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

$\Rightarrow 24 + 2b = 40$

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

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

$\therefore$ Breadth of the rectangle = 8 cm

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

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

Hence, the square encloses more area.

It encloses 4 cm^2 more area.

Question:16

A godown is 50 m long, 40 m broad and 10 m high. Find the cost of whitewashing its four walls and ceiling at Rs 20 per square metre.

Solution:

Given:

Length = 50 m

Breadth = 40 m

Height = 10 m

Area of the four walls = {2h(l + b)} sq. unit

= {2 $\times$ 10 $\times$ 50 + 40}m^2

$= \{20 \times 90\}\ m^2 = 1800\ m^2$

Area of the ceiling = $l \times b$ = (50 m × 40 m) = 2000 m^2

∴ Total area to be white washed = $1800 + 2000 m^2$ = 3800 m^2

Rate of white washing = Rs 20/sq. metre

∴ Total cost of white washing = Rs (3800 × 20) = Rs 76000

Question:17

The area of the 4 walls of a room is 168 m^2. The breadth and height of the room are 10 m and 4 m respectively. Find the length of the room.

Solution:

Let the length of the room be l m.

Given:

Breadth of the room = 10 m

Height of the room = 4 m

Area of the four walls = $[2(l + b)h]$ sq units.

$= 168\ m^2$

∴ $168 = [2(l + 10) \times 4]$

⇒ $168 = [8l + 80]$

⇒ $168 - 80 = 8l$

⇒ $88 = 8l$

⇒ $l = \left(\frac{88}{8}\right)$ m = 11 m

∴ Length of the room = 11 m

Question:18

The area of the 4 walls of a room is 77 m^2. The length and breadth of the room are 7.5 m and 3.5 m respectively. Find the height of the room.

Solution:

Given:

Length of the room = 7.5 m

Breadth of the room = 3.5 m

Area of the four walls = $[2(l + b)h]$ sq. units.

$= 77\ m^2$

∴ $77 = [2(7.5 + 3.5)h]$

⇒ $77 = [(2 \times 11)h]$

⇒ $77 = 22h$

⇒ $h = \left(\frac{77}{22}\right)$ m = $\left(\frac{7}{2}\right)$ m = 3.5 m

∴ Height of the room = 3.5 m

Question:19

The area of four walls of a room is 120 m^2. If the length of the room is twice its breadth and the height is 4 m, find the area of the floor.

Solution:

Let the breadth of the room be x m.

Length of the room = $2x$ m

Area of the four walls = $\{2(l + b) \times h\}$ sq. units

$120\ m^2 = \{2(2x + x) \times 4\}\ m^2$

$\Rightarrow 120 = \{8 \times 3x\}$

$\Rightarrow 120 = 24x$

$\Rightarrow x = \left(\frac{120}{24}\right) = 5$

$\therefore$ Length of the room = $2x = (2 \times 5)$ m = 10 m

Breadth of the room = x = 5 m

$\therefore$ Area of the floor = $l \times b$ = (10 m $\times$ 5 m) = 50 m^2

Question:20

A room is 8.5 m long, 6.5 m broad and 3.4 m high. It has two doors, each measuring $1.5mby1m$ and two windows, each measuring $2mby1m$. Find the cost of painting its four walls at Rs 160 per m^2.

Solution:

Length = 8.5 m

Breadth = 6.5 m

Height = 3.4 m

Area of the four walls = $\{2(l + b) \times h\}$ sq. units

$= \{28.5 + 6.5 \times 3.4\} m^2 = \{30 \times 3.4\}\ m^2 = 102\ m^2$

Area of one door = $(1.5 \times 1)\ m^2 = 1.5\ m^2$

$\therefore$ Area of two doors = $(2 \times 1.5)\ m^2 = 3\ m^2$

Area of one window = $(2 \times 1)\ m^2 = 2\ m^2$

$\therefore$ Area of two windows = $(2 \times 2)\ m^2 = 4\ m^2$

Total area of two doors and two windows = $3 + 4\ m^2$

$= 7\ m^2$

Area to be painted = $102 - 7\ m^2 = 95\ m^2$

Rate of painting = Rs 160 per m^2

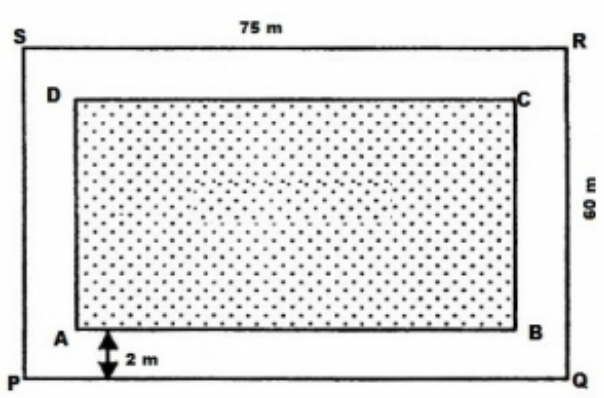
Total cost of painting = Rs (95×160) = Rs 15200

Question:21

A rectangular grassy plot is 75 m long and 60 m broad. If has path of width 2 m all around it on the inside. Find the area of the path and cost and of constructing it at Rs 125 per m^2.

Solution:

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) m^2 = 4500 m^2

Width of the path = 2 m

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

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

Area of rectangle ABCD = $71x56 m^2$ = 3976 m^2

Area of the path = $Areaof PQRS - Areaof ABCD$

$= 4500-3976 m^2$ = 524 m^2

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

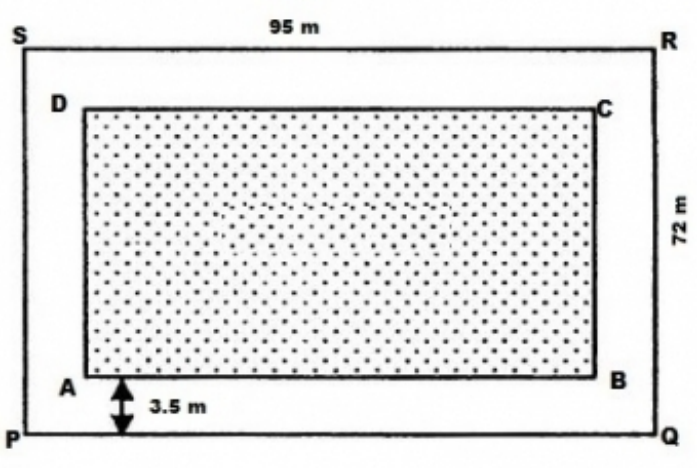
$\therefore$ Total cost of constructing the path = Rs (524 $\times$ 125) = Rs 65,500

Question:22

A rectangular plot of land measures 95 m by 72 m. Inside the plot, a path of uniform width of 3.5 m is to be constructed all around. The rest of the plot is to be laid with grass. Find the total expenses involved in constructing the path at Rs 80 per m^2 and laying the grass at Rs 40 per m^2.

Solution:

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) m^2 = 6,840 m^2

Width of the path = 3.5 m

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

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

Area of the grassy rectangle plot ABCD = (88 $\times$ 65) m^2 = 5,720 m^2

Area of the path = $AreaPQRS - AreaABCD$

= $6840 - 5720 m^2$ = 1,120 m^2

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

$\therefore$ Total cost of constructing the path = Rs. (1,120 $\times$ 80) = 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) = Rs. 2,28,800

$\therefore$ Total expenses involved = Rs. $89,600 + 2,28,800$= Rs. 3,18,400

Question:23

A saree is 5 m long and 1.3 m wide. A border of width 25 cm is printed along its sides. Find the cost of printing the border at Rs 1 per 10 cm^2.

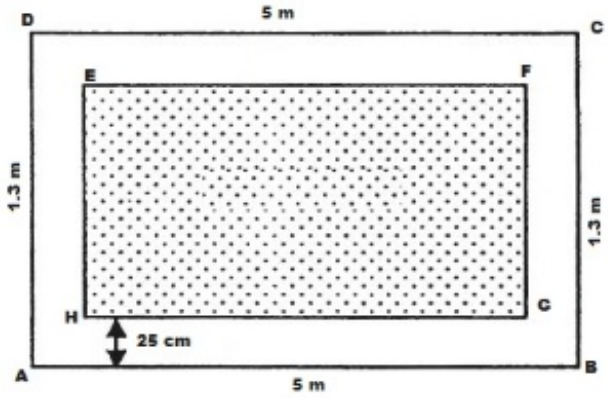
Solution:

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

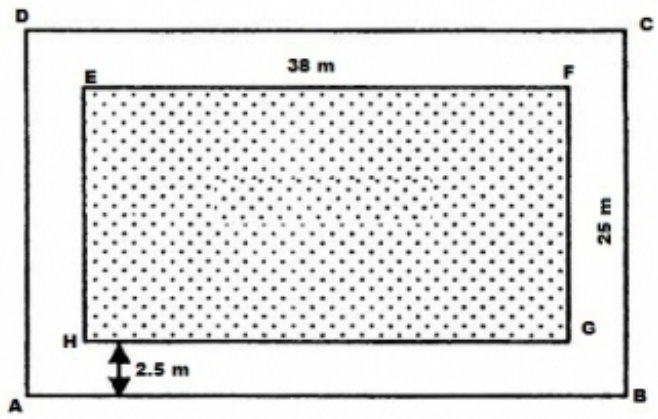


$\therefore$ Area of ABCD = 5 m $\times$ 1.3 m = 6.5 m^2

Length, GH = {5 -(0.25 + 0.25} m = 4.5 m
Breadth, FG = {1.3 - 0.25 + 0.25} m = 0.8 m
$\therefore$ Area of EFGH = 4.5 m $\times$ .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
$\therefore$ Total cost of printing the border = Rs $\left(\frac{1\times29000}{10}\right)$
= Rs 2900

Question:24
A rectangular grassy lawn measuring 38 m by 25 m has been surrounded externally by a 2.5-m-wide path. Calculate the cost of gravelling the path at the rate of Rs 120 per m^2.
Solution:
Length, EF = 38 m
Breadth, FG = 25 m



$\therefore$ Area of EFGH = 38 m $\times$ 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 $\times$ 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 $\times$ 340)

= Rs 40800

Question:25

A room 9.5 m long and 6 m wide is surrounded by a 1.25-m-long verandah. Calculate cost of cementing the floor of this verandah at Rs 80 per m^2.

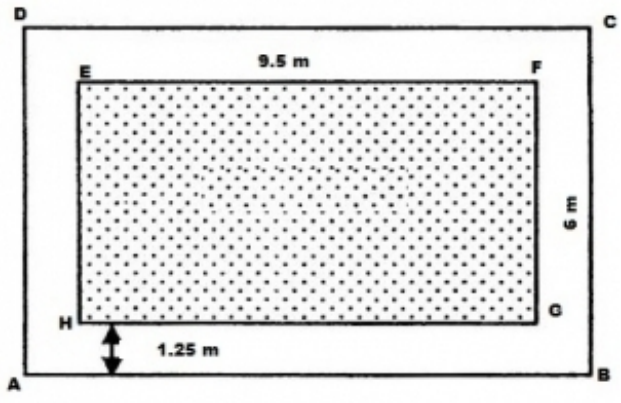
Solution:

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 $\times$ 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 $\times$ 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 $\times$ 45)

= Rs 3600

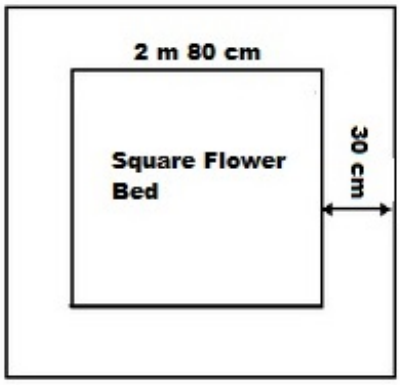
Question:26

Each side of a square flower bed is 2 m 80 cm long. It is extended by digging a strip 30 cm wide all around it. Find the area of the enlarged flower bed and also the increase in the area of the flower bed.

Solution:

Side of the flower bed = 2 m 80 cm = 2.80 m

$$since 100cm = 1m$$



∴ Area of the square flower bed = $Side^2 = 2.80m^2$ = 7.84 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 = $Side^2 = 3.4^2$ = 11.56 m^2

∴ Increase in the area of the flower bed = 11.56 m^2 – 7.84 m^2

= 3.72 m^2

Question:27

The length and breadth of a park in the ratio 2 : 1 and its perimeter is 240 m. A path 2 m wide runs inside it, along its boundary. Find the cost of paving the path at Rs 80 per m^2.

Solution:

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

⇒ 2(2x + x) = 240

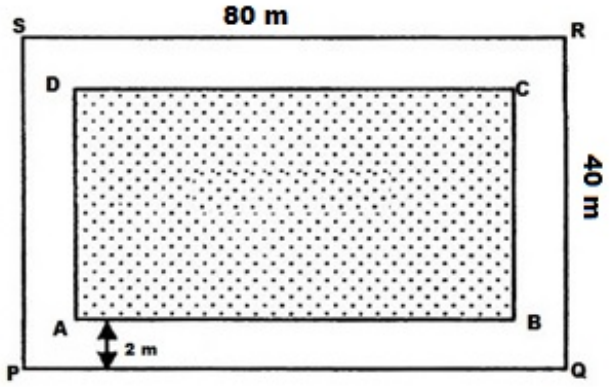
⇒ 6x = 240

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

∴ 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 $\times$ 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 $\times$ 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 $\times$ 80) = Rs. 37,120

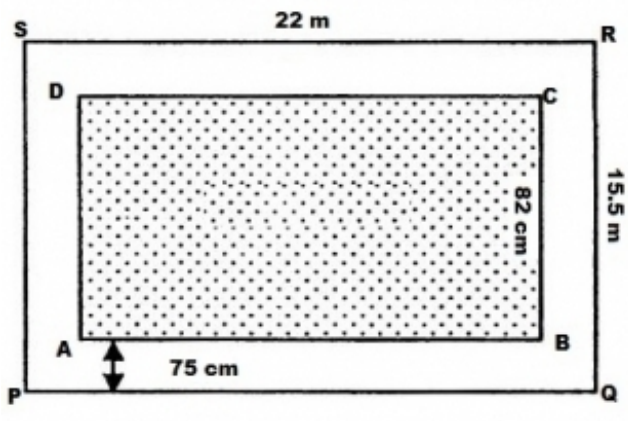
Question:28

A school has a hall which is 22 m long and 15.5 m broad. A carpet is laid inside the hall leaving all around a margin of 75 cm from the walls. Find the area of the carpet and the area of the strip left uncovered. If the width of the carpet is 82 cm, find its cost at the rate of Rs 60 per m.

Solution:

Length of the hall, PQ = 22 m

Breadth of the hall, QR = 15.5 m



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

Length of the carpet, AB = 22 m – $0.75m + 0.75m$= 20.5 m

$$since 100cm = 1m$$

Breadth of the carpet, BC = 15.5 m – $0.75m + 0.75m$= 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

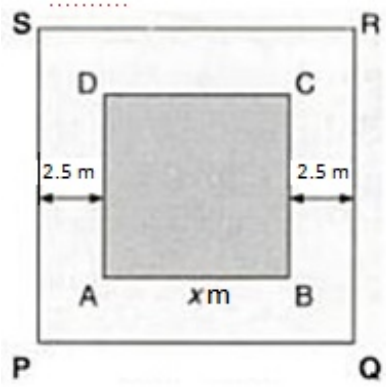
Cost of the 350 m long carpet = Rs 60 × 350 = Rs 21000

Question:29

A square lawn is surrounded by a path 2.5 m wide. If the area of the path is 165 m^2, find the area of the lawn.

Solution:

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 + 10*x* + 25) m^2

Area of the path = Area of PQRS – Area of the square lawn $ABCD$

⇒ 165 = x^2 + 10*x* + 25 – x^2

⇒ 165 = 10*x* + 25

⇒ 165 – 25 = 10*x*

⇒ 140 = 10*x*

∴ *x* = 140 ÷ 10 = 14

∴ Side of the lawn = 14 m

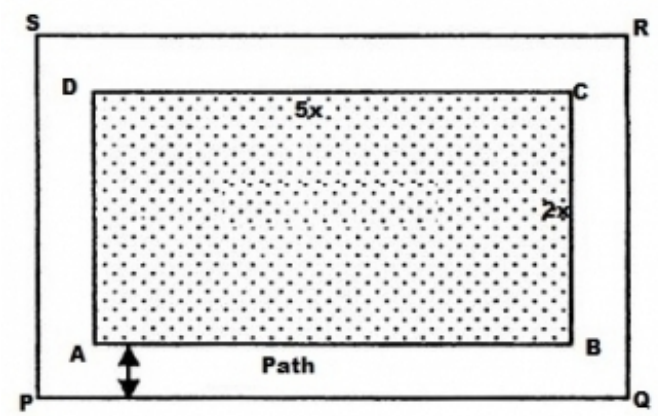
∴ Area of the lawn = $Side^2 = 14m^2$ = 196 m^2

Question:30

The length and breadth of a rectangular park are in the ratio 5 : 2. A 2.5-m-wide path running all around the outside of the aprk has an area of 305 m^2. Find the dimensions of the park.

Solution:

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

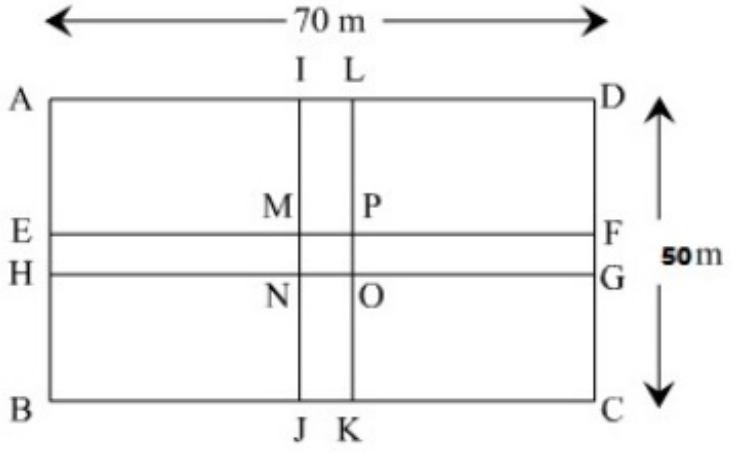
Question:31

A rectangular lawn 70 m by 50 m has two roads, each 5 m wide, running through its middle, one parallel to its length and the other parallel to its breadth. Find the cost of constructing the roads at Rs 120 per m^2.

Solution:

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

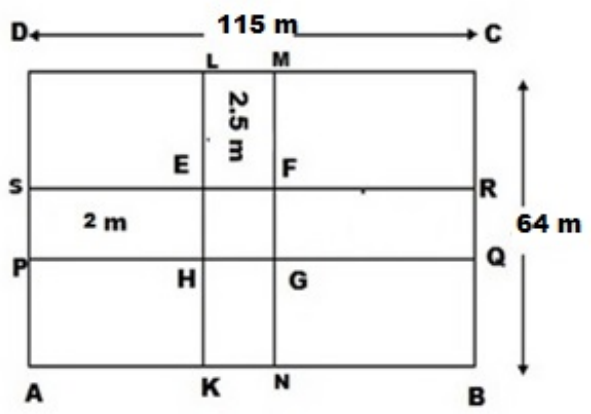
= Rs. 69000

Question:32

A 115-m-long and 64-m-broad lawn has two roads at right angles, one 2 m wide, running parallel to its length, and the other 2.5 m wide, running parallel to its breadth. Find the cost of gravelling the roads at Rs 60 per m^2.

Solution:

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 $\times$ 64 m = 7360 m^2

Area of the road PQRS = 115 m $\times$ 2 m = 230 m^2

Area of the road KLMN = 64 m $\times$ 2.5 m = 160 m^2

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

∴ Area of EFGH = 2 m $\times$ 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 $\times$ 60)

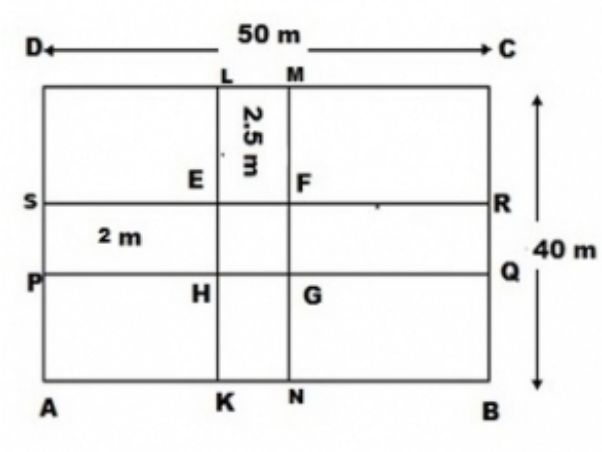
= Rs 23,100

Question:33

A rectangular field is 50 m by 40 m. It has two roads through its centre, running parallel to its sides. The width of the longer and the shorter roads are 2 m and 2.5-m-respectively. Find the area of the roads and the area of the remaining portion of the field.

Solution:

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 $\times$ 40 m = 2000 m^2

Area of road KLMN = 40 m $\times$ 2.5 m = 100 m^2

Area of road PQRS = 50 m $\times$ 2 m = 100 m^2

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

∴ Area of EFGH = 2.5 m $\times$ 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

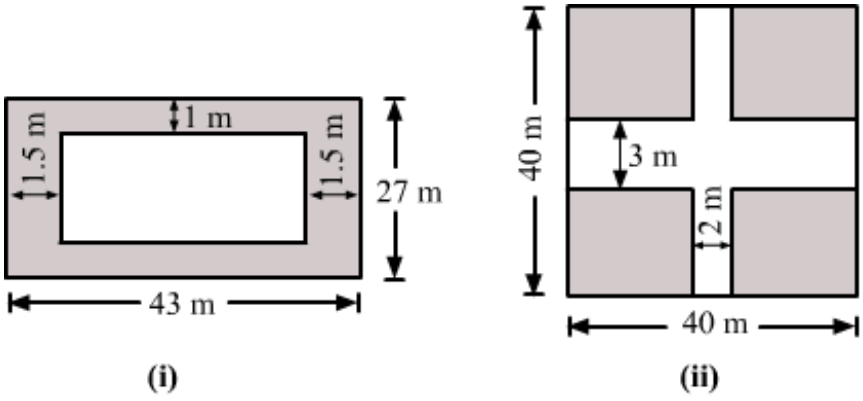
Area of the remaining portion of the field = Area of the rectangular field $ABCD$ – Area of the roads

$= 2000 - 195 m^2$

= 1805 m^2

Question:34

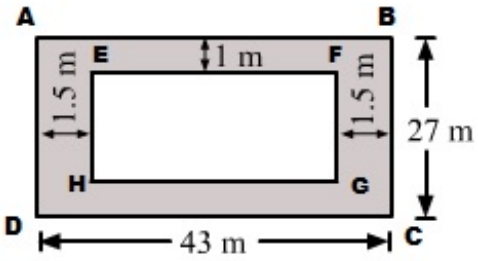
Calculate the area of the shaded region in each of the figures given below:



(i) (ii)

Solution:

i Complete the rectangle as shown below:



Area of the shaded region =

$$Areaofrectangle ABCD - Areaofrectangle EFGH$$

sq. units

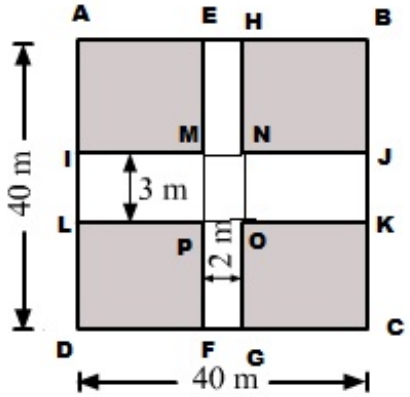
= [(43 m $\times$ 27 m) - {(43 - 2 $\times$ 1.5) m x (27 - 1 $\times$ 2) m}]

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

= 1161 m^2 - 1000 m^2

= 161 m^2

ii Complete the rectangle as shown below:



Area of the shaded region =

$$Areaofsquare ABCD - (Areaof EFGH) + (Areaof IJKL) - (Areaof MNOP)$$

sq. units

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

=

$$\boxed{1600 - \{(80 + 120 - 6)}$$

m^2

=

$$1600 - 194$$

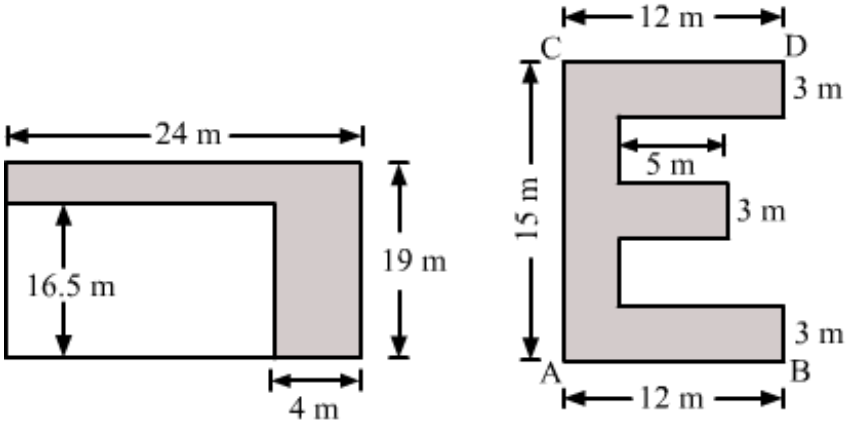
m^2

= 1406 m^2

Question:35

Calculate the area of the shaded region in each of the figures given below.

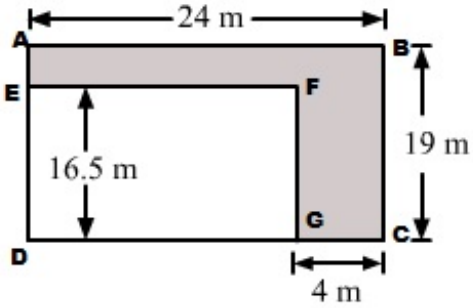
Fig. ii has uniform width of 3 cm and it is given that *AB* = *CD*.



(i) (ii)

Solution:

i Complete the rectangle as shown below:



Area of the shaded region =

$$Area of rectangle ABCD - Area of rectangle EFGD$$

sq. units

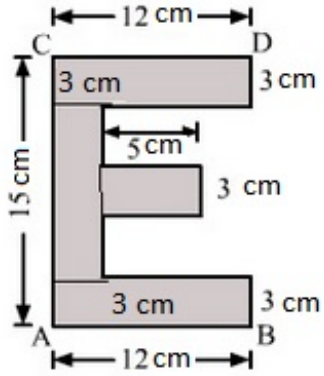
= [(AB $\times$ BC) - (DG $\times$ GF)] m^2

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

= [(24 m 19 m) - (20 m 16.5) m]

= 456 - 330 m^2 = 126 m^2

ii Complete the rectangle by drawing lines as shown below:



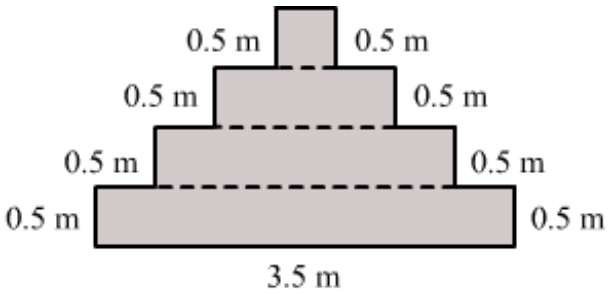
Area of the shaded region ={(12 3) + (12 3) + (5 3) + {15 - 3 - 3 3)} cm^2

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

= 114 cm^2

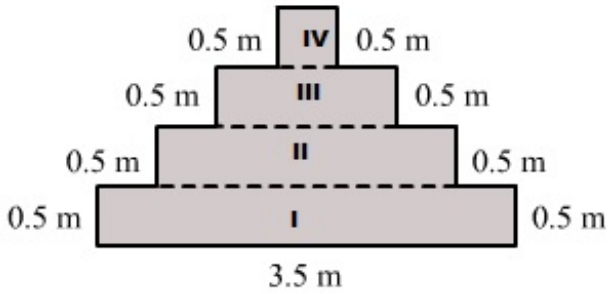
Question:36

In the given figure, all steps are 0.5 m high. Find the area of the shaded region.



Solution:

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

$= [(3.5 \times 0.5) + (2.5 \times 0.5) + (1.5 \times 0.5) + (0.5 \times 0.5)]\ m^2$

$= 1.75 + 1.25 + 0.75 + 0.25\ m^2$

$= 4\ m^2$

Question:37

Find the area of a parallelogram with base 32 cm and height 16.5 cm.

Solution:

Base = 32 cm

Height = 16.5 cm

∴ Area of the parallelogram = Base × Height

$= 32\ cm \times 16.5\ cm$

$= 528\ cm^2$

Question:38

The base of a parallelogram measures 1 m 60 cm and its height is 75 cm. Find its area in m^2.

Solution:

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

Height = 75 cm = 0.75 m

∴ Area of the parallelogram = Base × Height

$= 1.6\ m \times 0.75\ m$

$= 1.2\ m^2$

Question:39

In a parallelogram it is being given that base = 14 dm and height = 6.5 dm. Find its area in

i cm^2.

ii m^2.

Solution:

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

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

Area of the parallelogram = Base × Height

= 140 cm 65 cm

= 9100 cm^2

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

∴ Area of the parallelogram = Base Height

= 1.4 m 0.65 m

= 0.91 m^2

Question:40

Find the height of a parallelogram whose area is 54 cm^2 and the base is 15 cm.

Solution:

Area of the given parallelogram = 54 cm^2

Base of the given parallelogram = 15 cm

∴ Height of the given parallelogram = = cm = 3.6 cm

Question:41

One side of a parallelogram is 18 cm long and its area is 153 cm^2. Find the distance of the given side from its opposite side.

Solution:

Base of the parallelogram = 18 cm

Area of the parallelogram = 153 cm^2

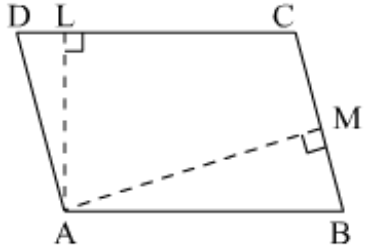
∴ Area of the parallelogram = Base Height

⇒ Height = = cm = 8.5 cm

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

Question:42

In a parallelogram *ABCD*, *AB* = 18 cm, *BC* = 12 cm. *AL* ⊥ *DC* and *AM* ⊥ *B*C.



If *AL* = 6.4 cm, find the length of *AM*.

Solution:

Base, AB = 18 cm

Height, AL = 6.4 cm

∴ Area of the parallelogram ABCD = Base Height

= (18 cm 6.4 cm) = 115.2 cm^2 ... i

Now, taking BC as the base:

Area of the parallelogram ABCD = Base Height

= (12 cm AM) ... ii

From equation i and ii:

12 cm AM = 115.2 cm^2

⇒ AM = cm

= 9.6 cm

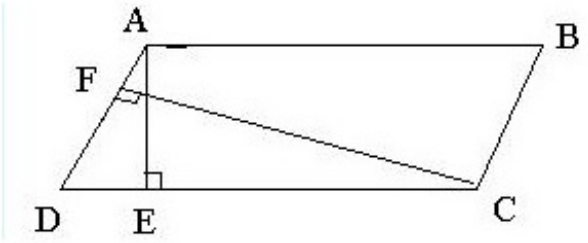
Question:43

The adjacent sides of a parallelogram are 15 cm and 8 cm. If the distance between the longer sides is 4 cm, find the distance between the shorter sides.

Solution:

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 × Height

We have two altitudes and two corresponding bases.

∴ *AD CF* = *AB AE*

⇒ 8 cm *CF* = 15 cm 4 cm

⇒ *CF* = cm = cm = 7.5 cm

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

Question:44

The height of a parallelogram is one-third of its base. If the area of the parallelogram is 108 cm^2, find its base and height.

Solution:

Let the base of the parallelogram be x cm.

Then, the height of the parallelogram will be x cm.

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

Area of a parallelogram = Base Height

$\therefore 108\ cm^2 = x \ x$

$108\ cm^2 = x^2$

$\Rightarrow x^2 = (108\ 3)\ cm^2 = 324\ cm^2$

$\Rightarrow x^2 = 18\ cm^2$

$\Rightarrow x = 18$ cm

$\therefore$ Base $= x = 18$ cm

Height $= x =$ cm

$= 6$ cm

Question:45

The base of a parallelogram is twice its height. If the area of the parallelogram is 512 cm^2. find the base and the height.

Solution:

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 Height

$\therefore 512\ cm^2 = 2x \ x$

$512\ cm^2 = 2x^2$

$\Rightarrow x^2 = cm^2 = 256\ cm^2$

$\Rightarrow x^2 = 16\ cm^2$

$\Rightarrow x = 16$ cm

$\therefore$ Base $= 2x = 2\ 16$

$= 32$ cm

Height $= x = 16$ cm

Question:46

Find the area of a rhombus in which

i each side = 12 cm and height = 7.5 cm.

ii each side = 2 dm and height = 12.6 cm.

Solution:

A rhombus is a special type of a parallelogram.

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

∴ Area of the given rhombus = Base × Height

i Area of the rhombus = 12 cm 7.5 cm = 90 cm^2

ii Base = 2 dm = (2 10) = 20 cm since 1 dm = 10 cm

Height = 12.6 cm

∴ Area of the rhombus = 20 cm 12.6 cm = 252 cm^2

Question:47

Find the area of a rhombus, the lengths of whose diagonals are:

i 16 cm and 28 cm,

ii 8 dm 5 cm and 5 dm 6 cm.

Solution:

i

Length of one diagonal = 16 cm

Length of the other diagonal = 28 cm

∴ Area of the rhombus = Product of the diagonals

= cm^2 = 224 cm^2

ii

Length of one diagonal = 8 dm 5 cm = (8 10 + 5) cm = 85 cm since 1 dm = 10 cm

Length of the other diagonal = 5 dm 6 cm = (5 10 + 6) cm = 56 cm

∴ Area of the rhombus = Product of the diagonals

= cm^2

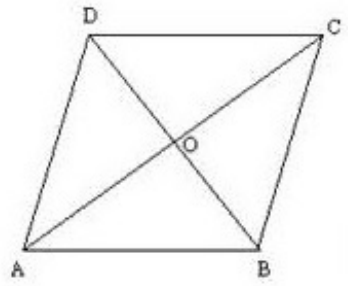
= 2380 cm^2

Question:48

Find the area of a rhombus each side of which measures 20 cm and one of whose diagoanls is 24 cm.

Solution:

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



AB = 20 cm and AC = 24 cm

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

Therefore, ΔAOB is a right angled triangle, right angled at O.

Here, OA = = 12 cm

AB = 20 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 cm

$\therefore$ BD = 2 OB = 2 16 cm = 32 cm

$\therefore$ Area of the rhombus ABCD = cm^2

$= cm^2$

$= 384\ cm^2$

Question:49

The area of a rhombus is 148.8 cm^2. If one of its diagonals is 19.2 cm, find the length of the other diagonal.

Solution:

Area of a rhombus = Product of the diagonals

Given:

Length of one diagonal = 19.2 cm

Area of the rhombus = 148.8 cm^2

∴ Length of the other diagonal = cm = 15.5 cm

Question:50

The area of a rhombus is 119 cm^2 and its perimeter is 56 cm. Find its height.

Solution:

Perimeter of the rhombus = 56 cm

Area of the rhombus = 119 cm^2

Side of the rhombus = = cm = 14 cm

Area of a rhombus = Base Height

∴ Height of the rhombus = = cm

= 8.5 cm

Question:51

The area of a rhombus is 441 cm^2 and its height is 17.5 cm. Find the length of each side of the rhombus.

Solution:

Given:

Height of the rhombus = 17.5 cm

Area of the rhombus = 441 cm^2

We know:

Area of a rhombus = Base Height

∴ Base of the rhombus = = cm = 25.2 cm

Hence, each side of a rhombus is 25.2 cm.

Question:52

The area of a rhombus is equal to the area of a triangle whose base and the corresponding height are 24.8 cm and 16.5 cm respectively. If one of the diagonals of the rhombus is 22 cm, find the lenght of the other diagonal.

Solution:

Area of a triangle = Base Height

= cm^2 = 204.6 cm^2

Given:

Area of the rhombus = Area of the triangle

Area of the rhombus = 204.6 cm^2

Area of the rhombus = Product of the diagonals

Given:

Length of one diagonal = 22 cm

∴ Length of the other diagonal = cm

= 18.6 cm

Question:53

Find the area of the triangle in which

i base = 42 cm and height = 25 cm,

ii base = 16.8 m and height = 75 cm,

iii base = 8 dm and height = 35 cm,

Solution:

We know:

Area of a triangle =

i Base = 42 cm

Height = 25 cm

∴ Area of the triangle = cm^2 = 525 cm^2

ii Base = 16.8 m

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

∴ Area of the triangle = m^2 = 6.3 m^2

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

Height = 35 cm

∴ Area of the triangle = cm^2 = 1400 cm^2

Question:54

Find the height of a triangle having an area of 72 cm^2 and base 16 cm.

Solution:

Height of a triangle =

Here, base = 16 cm and area = 72 cm^2

∴ Height = cm = 9 cm

Question:55

Find the height of a triangle region having an area of 224 m^2 and base 28 m.

Solution:

Height of a triangle =

Here, base = 28 m and area = 224 m^2

$\therefore$ Height = m = 16 m

Question:56

Find the base of a triangle whose are is 90 cm^2 and height 12 cm.

Solution:

Base of a triangle =

Here, height = 12 cm and area = 90 cm^2

$\therefore$ Base = cm = 15 cm

Question:57

The base of a triangular field is three times its height. If the cost of cultivating the field at Rs 1080 per hectare is Rs 14580, find its base and height.

Solution:

Total cost of cultivating the field = Rs. 14580

Rate of cultivating the field = Rs. 1080 per hectare

Area of the field = hectare

= hectare

= 13.5 hectare

= (13.5 10000) m^2 = 135000 m^2 [since 1 hectare = 10000 m^2]

Let the height of the field be x m.

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

Area of the field = m^2 = m^2

$\therefore$ = 135000

$\Rightarrow$

$\Rightarrow x$ = = 300

$\therefore$ Base = (3 300) = 900 m

Height = 300 m

Question:58

The area of right triangular region is 129.5 cm^2. If one of the sides containing the right angle is 14.8

cm, find the other one.

Solution:

Let the length of the other leg be h cm.

Then, area of the triangle = cm^2 = (7.4 h) cm^2

But it is given that the area of the triangle is 129.5 cm^2.

$\therefore 7.4h = 129.5$

$\Rightarrow h = = 17.5$ cm

$\therefore$ Length of the other leg = 17.5 cm

Question:59

Find the area of a right triangle whose base is 1.2 m and hypotenuse 3.7 m.

Solution:

Here, base = 1.2 m and hypotenuse = 3.7 m

In the right angled triangle:

Perpendicular =

Area = sq. units

= m^2

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

Question:60

The legs of a right triangle are in the ratio 3 : 4 and its area is 1014 cm^2. Find the lengths of its legs.

Solution:

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.

Area of the triangle = cm^2

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

$\Rightarrow 1014 = 6x^2$

$\Rightarrow x^2 = = 169$

$\Rightarrow x = = 13$

$\therefore$ Base = (3 13) = 39 cm

Height = (4 13) = 52 cm

Question:61

One side of a right-angled triangular scarf is 80 cm and its longest side is 1 m. Find its cost at the rate of Rs 250 per m^2.

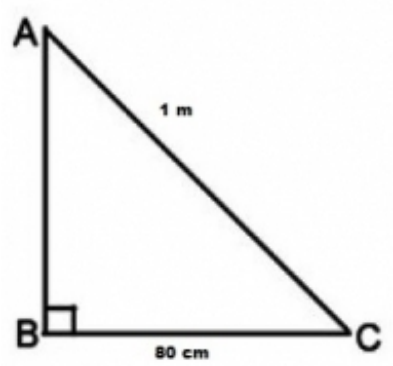
Solution:

Consider a right-angled triangular scarf ABC.

Here, $\angle B = 90°$

BC = 80 cm

AC = 1 m = 100 cm



Now, $AB^2 + BC^2 = AC^2$

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

$= 10000 - 6400 = 3600$

$\Rightarrow AB =$ $= 60$ cm

Area of the scarf ABC = sq. units

$= cm^2$

$= 2400\ cm^2 = 0.24\ m^2$ [since $1\ m^2 = 10000\ cm^2$]

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.

Question:62

Find the area of an equilateral triangle each of whose sides measures i 18 cm, ii 20 cm.

[Take = 1.73]

Solution:

i Side of the equilateral triangle = 18 cm

Area of the equilateral triangle = sq. units

$= cm^2 = cm^2$

$= (1.73\ \ 81)\ cm^2 = 140.13\ cm^2$

ii Side of the equilateral triangle = 20 cm

Area of the equilateral triangle = sq. units

$= cm^2 = cm^2$

$= (1.73 \ \ 100)\ cm^2 = 173\ cm^2$

Question:63

The area of an equilateral triangle is . Find the length of each side the triangle.

Solution:

It is given that the area of an equilateral triangle is cm^2.

We know:

Area of an equilateral triangle = sq. units

∴ Side of the equilateral triangle = cm

$=$ cm = cm = cm = 8 cm

Hence, the length of the equilateral triangle is 8 cm.

Question:64

Find the length of the height of an equilateral triangle of side 24 cm. (Take =1.73)

Solution:

Let the height of the triangle be h cm.

Area of the triangle = sq. units

$= cm^2$

Let the side of the equilateral triangle be a cm.

Area of the equilateral triangle = sq. units

$= cm^2 = cm^2$

∴ =

⇒ 12 h =

⇒ h = cm

∴ Height of the equilateral triangle = 20.76 cm

Question:65

Find the area of the triangle in which

i a = 13 m, b = 14 m, c = 15m:

ii a = 52 m, b = 56 cm, c = 60 cm:

iii a = 91 m, b = 98 m, c = 105 m.

Solution:

i Let a = 13 m, b = 14 m and c = 15 m

s = = m = 21 m

∴ Area of the triangle = sq. units

= m^2

= m^2

= m^2

= (2 2 3 7) m^2

= 84 m^2

ii Let a = 52 cm, b = 56 cm and c = 60 cm

s = = cm = 84 cm

∴ Area of the triangle = sq. units

= cm^2

= cm^2

= cm^2

= cm^2

= (2 2 2 2 2 2 3 3 7) m^2

= 1344 cm^2

iii Let a = 91 m, b = 98 m and c = 105 m

s = = m = 147 m

∴ Area of the triangle = sq. units

= m^2

= m^2

= m^2

= m^2

= (2 2 3 7 7 7) m^2

= 4116 m^2

Question:66

The lengths of the sides of a triangle are 33 cm, 44 cm and 55 respectively. Find the area of the triangle and hence find the height corresponding to the side measuring 44 cm.

Solution:

Let a = 33 cm, b = 44 cm and c = 55 cm

Then, s = = cm = cm = 66 cm

∴ Area of the triangle = sq. units

= cm^2

= cm^2

$= \text{cm}^2$

$= (6\ 11\ \ 11)\ \text{cm}^2 = 726\ \text{cm}^2$

Let the height on the side measuring 44 cm be h cm.

Then, Area =

$\Rightarrow 726\ \text{cm}^2 =$

$\Rightarrow h = \text{cm} = 33$ cm.

$\therefore$ Area of the triangle = $726\ \text{cm}^2$

Height corresponding to the side measuring 44 cm = 33 cm

Question:67

The sides of a triangle are in the ratio 13 : 14 : 15 and its perimeter is 84 cm. Find the area of the triangle.

Solution:

Let $a = 13x$ cm, $b = 14x$ cm and $c = 15x$ cm

Perimeter of the triangle = $13x + 14x + 15x = 84$ given

$\Rightarrow 42x = 84$

$\Rightarrow x =$

$\therefore a = 26$ cm , $b = 28$ cm and $c = 30$ cm

$s = = \text{cm} = \text{cm} = 42$ cm

$\therefore$ Area of the triangle = sq. units

$= \text{cm}^2$

$= \ \text{cm}^2$

$= \text{cm}^2$

$= (2\ 4\ \ 6\ \ 7)\ \text{cm}^2 = 336\ \text{cm}^2$

Hence, area of the given triangle is $336\ \text{cm}^2$.

Question:68

The sides of a triangle are 42 cm, 34 cm and 20 cm. Calculate its area and the length of the height on the longest side.

Solution:

Let $a = 42$ cm, $b = 34$ cm and $c = 20$ cm

Then, $s = = \text{cm} = \text{cm} = 48$ cm

$\therefore$ Area of the triangle = sq. units

$= \text{cm}^2$

$= \ \text{cm}^2$

= cm^2

= (2 2 6 14) cm^2 = 336 cm^2

Let the height on the side measuring 42 cm be *h* cm.

Then, Area =

⇒ 336 cm^2 =

⇒ *h* = cm = 16 cm

∴ Area of the triangle = 336 cm^2

Height corresponding to the side measuring 42 cm = 16 cm

Question:69

The base of an isosceles triangle is 48 cm and one of its equal sides is 30 cm. Find the area of the triangle.

Solution:

Let each of the equal sides be *a* cm.

b = 48 cm

a = 30 cm

Area of the triangle = sq. units

= cm^2 = cm^2

= cm^2 = cm^2 = (24 18) cm^2 = 432 cm^2

∴ Area of the triangle = 432 cm^2

Question:70

The base of an isosceles triangle is 12 cm and its perimeter is 32 cm. Find its area.

Solution:

Let each of the equal sides be *a* cm.

a + *a* + 12 = 32 ⇒ 2*a* = 20 ⇒ a = 10

∴ *b* = 12 cm and *a* = 10 cm

Area of the triangle = sq. units

= cm^2 = cm^2

= cm^2 = (6 8) cm^2

= 48 cm^2

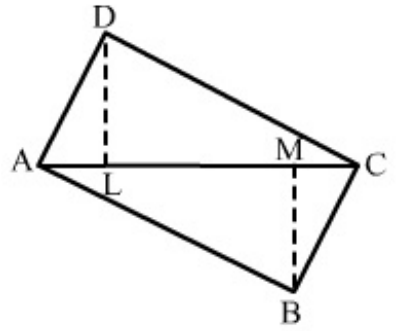
Question:71

A diagonal of a quadrilateral is 26 cm and the perpendiculars drawn to it from the opposite vertices are 12.8 cm and 11.2 cm. Find the area of the quadrilateral.

Solution:

We have:

$AC = 26$ cm, $DL = 12.8$ cm and $BM = 11.2$ cm



Area of ΔADC = AC DL

= 26 cm 12.8 cm = 166.4 cm^2

Area of ΔABC = AC BM

= 26 cm 11.2 cm = 145.6 cm^2

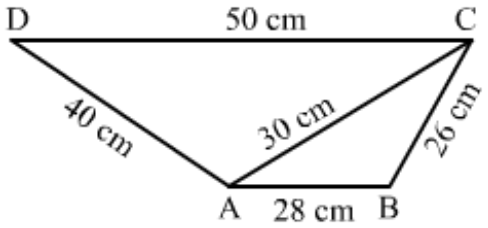
$\therefore$ Area of the quadrilateral $ABCD$ = Area of ΔADC + Area of ΔABC

= 166.4 + 145.6 cm^2

= 312 cm^2

Question:72

In a quadrilateral $ABCD$, $AB = 28$ cm, $BC = 26$ cm, $CD = 50$ cm, $DA = 40$ cm and diagonal $AC = 30$ cm. Find the area of the quadrilateral.



Solution:

First, we have to find the area of ΔABC and ΔACD.

For ΔACD:

Let $a = 30$ cm, $b = 40$ cm and $c = 50$ cm

$s =$ cm

$\therefore$ Area of triangle ACD = sq. units

= cm^2

= cm^2

= cm^2

= 600 cm^2

For ΔABC:

Let $a = 26$ cm, $b = 28$ cm and $c = 30$ cm

s = cm

∴ Area of triangle ABC = sq. units

= cm^2

= cm^2

= cm^2

= (2 2 2 2 3 7) cm^2

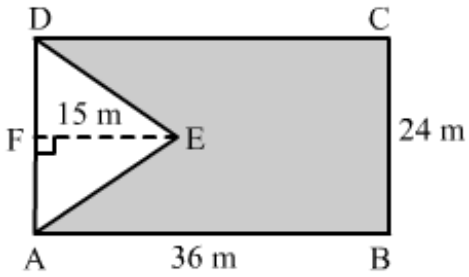
= 336 cm^2

∴ Area of the given quadrilateral ABCD = Area of ΔACD + Area of ΔABC

= 600 + 336 cm^2 = 936 cm^2

Question:73

In the given figure, *ABCD* is a rectangle with length = 36 m and breadth = 24 m. In Δ*ADE*, *EF* ⊥ *AD* and *EF* = 15 m. Calculate the area of the shaded region.



Solution:

Area of the rectangle = AB BC

= 36 m 24 m

= 864 m^2

Area of the triangle = AD FE

= BC FE since AD = BC

= 24 m 15 m

= 12 m 15 m = 180 m^2

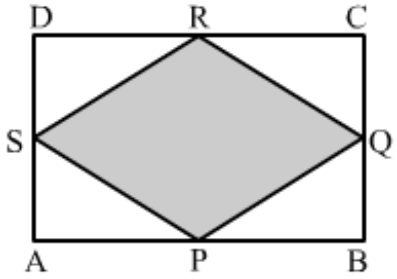
∴ Area of the shaded region = Area of the rectangle – Area of the triangle

= 864 – 180 m^2

= 684 m^2

Question:74

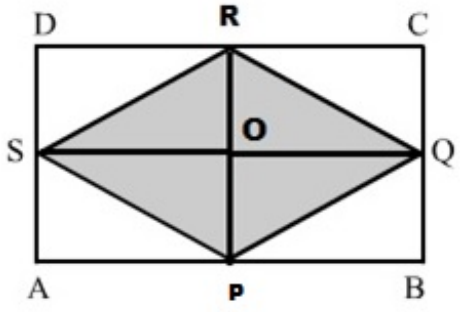
In the given figure, *ABCD* is a rectangle in which *AB* = 40 cm and *BC* = 25 cm. If *P,Q,R.S* be the midpoints of *AB*, *BC, CD* and *DA* respectively, find the area of the shaded region.



Solution:

Join points *PR* and *SQ*.

These two lines bisect each other at point *O.*



Here, $AB = DC = SQ = 40$ cm

$AD = BC = RP = 25$ cm

Also, $OP = OR = \ = 12.5$ cm

From the figure we observe:

Area of ΔSPQ = Area of ΔSRQ

$\therefore$ Area of the shaded region $= 2$ (Area of ΔSPQ)

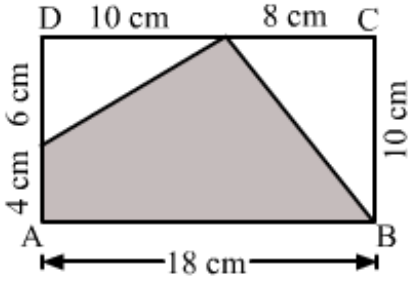
$= 2 (SQ \, OP)$

$= 2 \ (40 \text{ cm} \ \ 12.5 \text{ cm})$

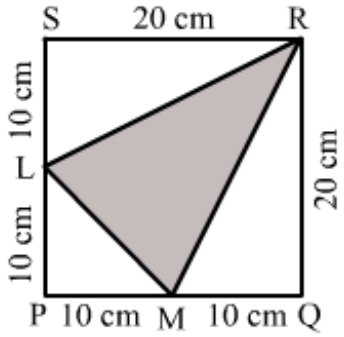
$= 500 \text{ cm}^2$

Question:75

In the following figures, find the area of the shaded region.



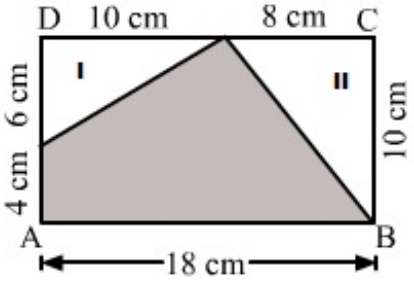
(i)



(ii)

Solution:

i Area of rectangle ABCD = 10 cm x 18 cm = 180 cm^2

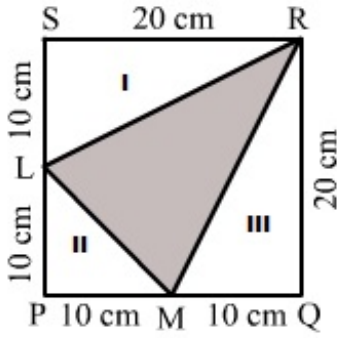


Area of triangle I = cm^2 = 30 cm^2

Area of triangle II = cm^2 = 40 cm^2

∴ Area of the shaded region = {180 - 30 + 40} cm^2 = { 180 - 70}cm^2 = 110 cm^2

ii Area of square ABCD = $Side^2$ = 20 cm^2 = 400 cm^2



Area of triangle I = cm^2 = 100 cm^2

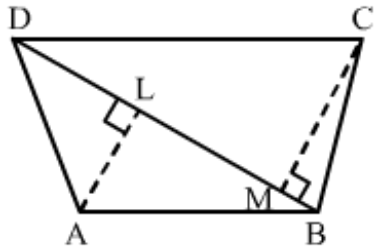
Area of triangle II = cm^2 = 50 cm^2

Area of triangle III = cm^2 = 100 cm^2

∴ Area of the shaded region = {400 - 100 + 50 + 100} cm^2 = { 400 - 250}cm^2 = 150 cm^2

Question:76

Find the area of quadrilateral *ABCD* in which diagonal *BD* = 24 cm. *AL* ⊥ *BD* and *CM* ⊥ *BD* such that *AL* = 5 cm and *CM* = 8 cm.



Solution:

Let ABCD be the given quadrilateral and let BD be the diagonal such that BD is of the length 24 cm.

Let AL ⊥ BD and CM ⊥ BD

Then, AL = 5 cm and CM = 8 cm

Area of the quadrilateral ABCD = Area of ΔABD + Area of ΔCBD

= sq. units

= cm^2

= 60 + 96 cm^2 = 156 cm^2

∴ Area of the given quadrilateral = 156 cm

Question:77

Find the circumference of a circle of radius 15 cm. Take π = 3.14.

Solution:

Here, *r* = 15 cm

∴ Circumference =

= (2 3.14 15) cm

= 94.2 cm

Hence, the circumference of the given circle is 94.2 cm

Question:78

Find the circumference of a circle whose radius is

i 28 cm.

ii 1.4 m.

Solution:

i Here, *r* = 28 cm

∴ Circumference = 2π *r*

= cm

= 176 cm

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

ii Here, *r* = 1.4 m

∴ Circumference = 2π *r*

= m

= m = 8.8 m

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

Question:79

Find the circumference of a circle whose diameter is

i 35 cm.

ii 4.9 m.

Solution:

i Here, $d = 35$ cm

Circumference $= 2\pi r$

$=$ [since $2r = d$]

$=$ cm $= (22 \ 5) = 110$ cm

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

ii Here, $d = 4.9$ m

Circumference $= 2\pi r$

$=$ [since $2r = d$]

$=$ m $= (22 \ 0.7) = 15.4$ m

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

Question:80

Find the radius of a circle whose circumference is 57.2 cm.

Solution:

Circumference of the given circle = 57.2 cm

$\therefore$ C = 57.2 cm

Let the radius of the given circle be r cm.

C =

$\Rightarrow r =$ cm

$\Rightarrow r =$ cm = 9.1 cm

Thus, radius of the given circle is 9.1 cm.

Question:81

Find the diameter of a circle whose circumference is 63.8 m.

Solution:

Circumference of the given circle = 63.8 m

$\therefore$ C = 63.8 m

Let the radius of the given circle be r cm.

C =

$\Rightarrow r =$

$\Rightarrow r =$ m =10.15 m

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

Question:82

The circumference of a circle exceeds its diameter by 30 cm. Find the radius of the circle.

Solution:

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

Then, its circumference =

Given:

Circumference - Diameter = 30 cm

$\therefore (-2r) = 30$

$\Rightarrow$

$\Rightarrow$

$\Rightarrow$

$\Rightarrow$

$\therefore$ Radius of the given circle = 7 cm

Question:83

The ratio of the radii of two circle is 5 : 3. Find the ratio of their circumferences.

Solution:

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

Let their circumferences be C_1 and C_2, respectively.

$C_1 =$

$C_2 =$

$\therefore$

$\Rightarrow C_1 : C_2 = 5:3$

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

Question:84

How long will a man take to make a round of a circular field of radius 21 m, cycling at the speed of 8 km/h?

Solution:

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

Distance covered by the cyclist = Circumference of the circular field

=

= m = 132 m

Speed of the cyclist = 8 km per hour = =

Time taken by the cyclist to cover the field =

=

=

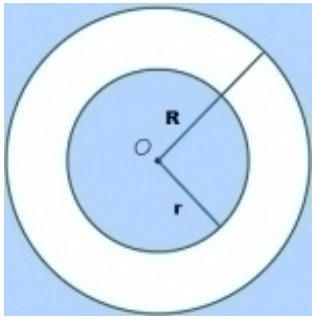
= 59.4 s

Question:85

A racetrack is in the form of a ring whose inner circumference is 528 m and the outer circumference is 616 m. Find the width of the track.

Solution:

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



Then, = 528

= 616

⇒

⇒ *r* =

R =

⇒ (*R* - *r*) = 98 - 84 m = 14 m

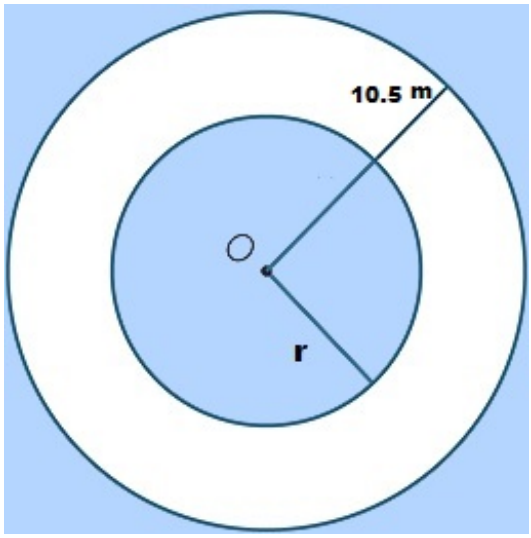
Hence, the width of the track is 14 m.

Question:86

The inner circumference of a circular track is 330 m. The track is 10.5 m wide everywhere. Calculate the cost of putting up a fence along the outer circle at the rate of Rs 20 per metre.

Solution:

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



Inner circumference = 330 m

∴ ⇒

⇒ *r* =

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 =

Rate of fencing = Rs. 20 per metre

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

Question:87

One circle has radius of 98 cm and a second concentric circle has a radius of 1 m 26 cm. How much longer is the circumference of the second circle than that of the first?

Solution:

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 =

= 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 =

= 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.

Question:88

A piece of wire is bent in the shape of an equilateral triangle each of whose sides measures 8.8 cm. This wire is rebent to form a circular ring. What is the diameter of the ring?

Solution:

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

⇒

⇒

⇒ r = cm = 4.2 cm

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

Hence, the diameter of the ring is 8.4 cm.

Question:89

A rhombus has the same perimeter as the circumference of a circle. If each side of the rhombus measures 33 cm, find the radius of the circle.

Solution:

Circumference of the circle = Perimeter of the rhombus

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

∴ Circumference of the circle = 132 cm

⇒

⇒

⇒ r = cm = 21 cm

Hence, the radius of the circle is 21 cm.

Question:90

A wire in the form of a rectangle 18.7 cm long and 14.3 cm wide is reshaped and bent into the form of a circle. Find the radius of the circle so formed.

Solution:

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

⇒

⇒

⇒ r = cm = 10.5 cm

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

Question:91

A wire is looped in the form of a circle of radius 35 cm. If it is rebent in the form of a square, what will be the length of each side of the square?

Solution:

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

Length of the wire = Circumference of the circle

⇒ Circumference of the circle = = cm = 220 cm

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

Perimeter of the square = 220 cm

⇒ $4a = 220$

⇒ a = cm = 55 cm

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

Question:92

The hour and minute hands of a clock are 4.2 cm and 7 cm long respectively. Find the sum of the distances covered by their tips in 1 day.

Solution:

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

Distance covered by the hour hand in 12 hours = = cm = 26.4 cm

∴ 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 = = cm = 44 cm

∴ Distance covered by the minute hand in 24 hours = 44×24 cm = 1056 cm

∴ Sum of the distances covered by the tips of both the hands in 1 day = $52.8 + 1056$ cm

= 1108.8 cm

Question:93

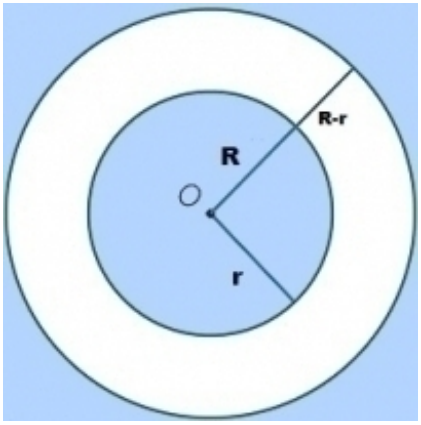
A well of diameter 140 cm has a stone parapet around it. If the lenght of the outer edge of the parapet is 616 cm, find the width of the parapet.

Solution:

Given:

Diameter of the well d = 140 cm.

Radius of the well (r) = 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

⇒

⇒

⇒ R = 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.

Question:94

Find the distance covered by the wheel of a bus in 2000 rotations if the diameter of the wheel is 98 cm.

Solution:

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 = = 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

Question:95

The diameter of the wheel of a cycle is 70 cm. How far will it go in 250 revolutions?

Solution:

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 = = 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.

Question:96

The diameter of the wheel of a car is 77 cm. How many revolutions will it make to travel 121 km?

Solution:

Diameter of the wheel = 77 cm

⇒ Radius of the wheel = cm

Circumference of the wheel =

= cm = 22 × 11 cm = 242 cm

= m = m

Distance covered by the wheel in 1 revolution = m

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

121 × 1000 m will be covered by the car in revolutions, i.e. 50000 revolutions.

∴ Required number of revolutions = 50000

Question:97

A bicycle wheel makes 5000 revolutions in moving 11 km. Find the circumference and the diameter of the wheel.

Solution:

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 = m =2.2 m = 220 cm since 1 m = 100 cm

Circumference of the wheel =
⇒ 220 cm =
⇒ Diameter of the wheel = cm = 70 cm
Hence, the circumference of the wheel is 220 cm and its diameter is 70 cm.

Question:98
Find the area of a circle whose radius is

i 21 cm.
ii 3.5 m.
Solution:
i Given:
r = 21 cm

∴ Area of the circle = sq. units
= cm^2 = cm^2 = 1386 cm^2

ii Given:
r = 3.5 m

Area of the circle = sq. units
= m^2 = m^2 = 38.5 m^2

Question:99
Find the area of a circle whose diameter is

i 28 cm.
ii 1.4 m.
Solution:
i Given:
d = 28 cm ⇒ r = = cm = 14 cm
Area of the circle = sq. units
= cm^2 = cm^2 = 616 cm^2

ii Given:

$r = 1.4$ m $\Rightarrow r =$ $=$ m $= 0.7$ m

Area of the circle = sq. units

$=$ $m^2 =$ $m^2 = 1.54$ m^2

Question:100

The circumference of a circle is 264 cm. Find its area.

Solution:

Let the radius of the circle be r cm.

Circumference = cm

$\therefore$ $= 264$

$\Rightarrow$

$\Rightarrow r =$ $= 42$

$\therefore$ Area of the circle $=$

$=$ cm^2

$= 5544$ cm^2

Question:101

The circumference of a circle is 35.2 m. Find its area.

Solution:

Let the radius of the circle be r m.

Then, its circumference will be m.

$\therefore$ $= 35.2$

$\Rightarrow$

$\Rightarrow r =$ $= 5.6$

$\therefore$ Area of the circle $=$

$=$ $m^2 = 98.56$ m^2

Question:102

The area of a circle is 616 cm^2. Find its circumference.

Solution:

Let the radius of the circle be r cm.

Then, its area will be cm^2.

$\therefore$ $= 616$

$\Rightarrow$ $= 616$

$\Rightarrow r^2 =$ $= 196$

$\Rightarrow r =$ $= 14$

⇒ Circumference of the circle = cm

= cm = 88 cm

Question:103

The area of a circle is 1381 m^2. Find its circumference.

Solution:

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

Then, area = m^2

∴ = 1386

⇒ = 1386

⇒ r^2 = = 441

⇒ *r* = = 21

⇒ Circumference of the circle = m

= m = 132 m

Question:104

The ratio of the radii of two circles is 4 : 5. Find the ratio of their areas.

Solution:

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

∴

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

Question:105

A horse is tied to a pole in a park with a string 21 m long. Find the area over which the horse can graze.

Solution:

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 = = m^2 = 1386 m^2

∴ Required area = 1386 m^2

Question:106

A steel wire when bent in the form of a square encloses an area of 121 cm^2. The same wire is bent in the form of a circle. find the area of the circle.

Solution:

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

$\Rightarrow$

$\Rightarrow$

$\Rightarrow r =$ = 7 cm

$\therefore$ Area of the circle =

= cm^2

= 154 cm^2

Question:107

A wire in a circular shape of radius 28 cm. If it is bent in the form of a square, what will be the area of the square formed?

Solution:

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 = cm = 176 cm

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

Perimeter of the square = 176 cm

$\Rightarrow 4a = 176$

$\Rightarrow a =$ cm = 44 cm

Thus, each side of the square is 44 cm.

Area of the square = Side^2 = a^2 = 44 cm^2

= 1936 cm^2

∴ Required area of the square formed = 1936 cm^2

Question:108

A rectangular sheet of acrylic is 34 cm by 24 cm. From it, 64 circular buttons, each of diameter 3.5 cm, have been cut out. Find the area of the remaining sheet.

Solution:

Area of the acrylic sheet = 34 cm × 24 cm = 816 cm^2

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

∴ Radius of the circular button (r)= cm = 1.75 cm

∴ Area of 1 circular button =

= cm^2

= 9.625 cm^2

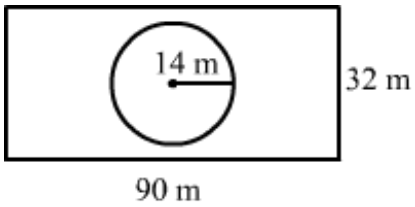
∴ Area of 64 such buttons = 64 × 9.625 cm^2 = 616 cm^2

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

= 816 - 616 cm^2 = 200 cm^2

Question:109

A rectangular ground is 90 m long and 32 m broad. In the middle of the ground there is a circular tank of radius 14 metres. Find the cost of turfing the remaining portion at the rate of Rs 50 per square metre.



Solution:

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 = = m^2

= 616 m^2

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

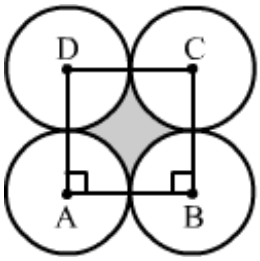
= 2880 - 616 m^2 = 2264 m^2

Rate of turfing = Rs 50 per sq. metre

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

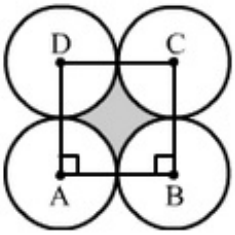
Question:110

In the given figure, four equal circles are described about the four corners of a square so that each circle touches two of the circle as shown in the figure. find the area of the shaded region, each side of the square measuring 14 cm.



Solution:

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 = cm^2

= $154\ cm^2$

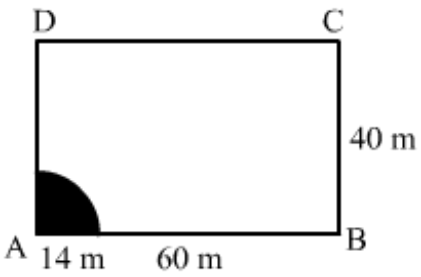
∴ Area of the shaded portion = Area of square ABCD - Areas of the four quadrants

= $196 - 154\ cm^2$

= $42\ cm^2$

Question:111

A horse is tethered to one corner of a rectangular field, 60 m by 40 m, by a rope 14 m long. On how much area can the horse graze?



Solution:

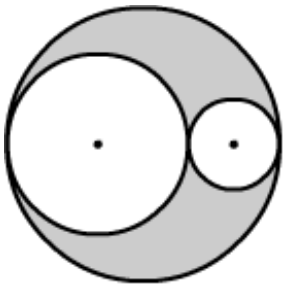
Let ABCD be the rectangular field.

Here, AB = 60 m
BC = 40 m

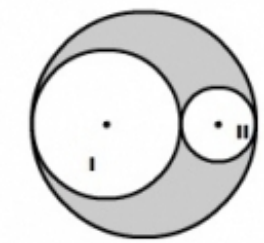
Let the horse be tethered to corner A by a 14 m long rope.

Then, it can graze through a quadrant of a circle of radius 14 m.
∴ Required area of the field = m^2 = 154 m^2
Hence, horse can graze 154 m^2 area of the rectangular field.

Question:112
In the given figure, a circle of diameter 21 cm is given. Inside this circle, two circles with diameters and of the diameter of the big circle have been drawn, as shown in the given figure. Find the area of the shaded region.



Solution:
Diameter of the big circle = 21 cm
Radius = cm = 10.5 cm
∴ Area of the bigger circle = = cm^2
= 346.5 cm^2



Diameter of circle I = of the diameter of the bigger circle
= of 21 cm = cm = 14 cm
Radius of circle I (r_1) = cm = 7 cm
∴ Area of circle I = = cm^2
= 154 cm^2

Diameter of circle II = of the diameter of the bigger circle
= of 21 cm = cm = 7 cm

Radius of circle II (r_2) = cm = 3.5 cm

∴ Area of circle II = = 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

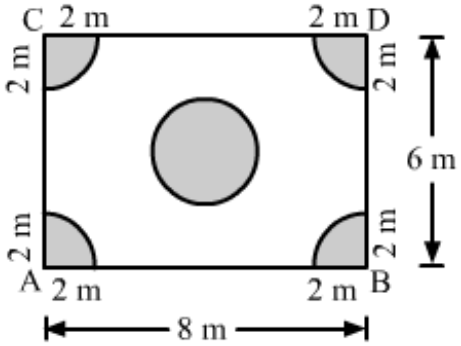
= {346.5 - 192.5} cm^2

= 154 cm^2

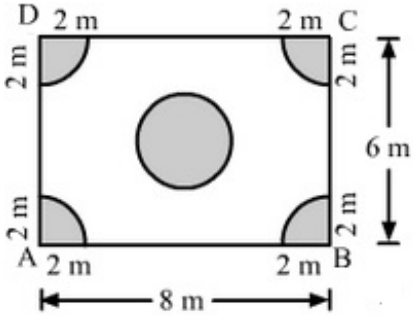
Hence, the area of the shaded portion is 154 cm^2

Question:113

In the given figure a rectangular plot of land measures 8 m by 6 m. In each of the corners, there is a flower bed in the form of a quadrant of a circle of radius 2 m. Also, there is a flower bed in the area of the remaining plot.



Solution:



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

∴ Area of the plot = 8 m × 6 m = 48 m^2

Area of the four flower beds = m^2 = m^2

Area of the circular flower bed in the middle of the plot =

= m^2 = m^2

Area of the remaining part = m^2

= m^2

$= m^2 = m^2 = 22.86\ m^2$

∴ Required area of the remaining plot = 22.86 m^2

Question:114

The length of a rectangle is 16 cm and the length of its diagonal is 20 cm. The area of the rectangle is

a 320 cm^2

b 160 cm^2

c 192 cm^2

d 156 cm^2

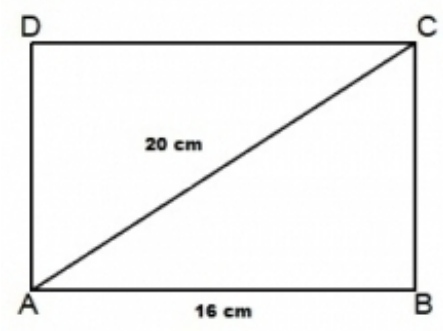
Solution:

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:

$AC^2 = AB^2 + BC^2$

$\Rightarrow 20^2 = 16^2 + x^2$

$\Rightarrow x^2 = 20^2 - 16^2 \Rightarrow \{400 - 256\} = 144$

$\Rightarrow x = = 12$

∴ BC = 12 cm

∴ Area of the plot = $16 \times 12\ cm^2 = 192\ cm^2$

Question:115

Each diagonal of a square is 12 cm long. Its area is

a 144 cm^2

b 72 cm^2

c 36 cm^2

d none of these

Solution:

b 72 cm^2

Given:

Diagonal of the square = 12 cm

∴ Area of the square = sq. units.

= cm^2

= 72 cm^2

Question:116

The area of a square is 200 cm^2. The length of its diagonal is

a 10 cm

b 20 cm

c cm

d 14.1 cm

Solution:

b 20 cm

Area of the square = sq. units.

Area of the square field = 200 cm^2

Diagonal of a square =

= cm = cm = 20 cm

∴ Length of the diagonal of the square = 20 cm

Question:117

The area of a square field is 0.5 hectare. The length of its diagonal is

a 100 m

b 50 m

c 250 m

d cm

Solution:

a 100 m

Area of the square = sq. units.

Given:

Area of square field = 0.5 hectare

= m^2 [since 1 hectare = 10000 m^2]

= 5000 m^2

Diagonal of a square =

= m = 100 m

Hence, the length of the diagonal of a square field is 100 m.

Question:118

The length of a rectangular field is thrice its breadth and its perimeter is 240 m. The length of the field is

a 80 m

b 120 m

c 90 m

d none of these

Solution:

c 90 m

Let the breadth of the rectangular field be x m.

Length = $3x$ m

Perimeter of the rectangular field = $2(l + b)$

$\Rightarrow 240 = 2(x + 3x)$

$\Rightarrow 240 = 2(4x)$

$\Rightarrow 240 = 8x \quad \Rightarrow x =$

$\therefore$ Length of the field = $3x = 3 \times 30$ m = 90 m

Question:119

On increasing each side of a square by 25% , the increase in area will be

a 25%

b 55%

c 40.5%

d 56.25%

Solution:

d 56.25%

Let the side of the square be a cm.

Area of the square = $(a)^2$ cm^2

Increased side = (a + 25% of a) cm

= cm = cm

Area of the square = cm^2

Increase in the area = cm^2= cm^2 = cm^2

% increase in the area =

= =

Question:120

The area of a square and that of a square drawn on its diagonal are in the ratio

a

b 1 : 2

c 1 : 3

d 1 : 4

Solution:

b 1:2

Let the side of the square be a.

Length of its diagonal =

∴ Required ratio =

Question:121

The perimeters of a square and a rectangle are equal. If their areas be A m^2 and B m^2, then which of the following is a true statement?

a $A < B$

b $A \leq B$

c $A > B$

d $A \geq B$

Solution:

c $A > B$

We know that a square encloses more area even though its perimeter is the same as that of the rectangle.

∴ Area of a square > Area of a rectangle

Question:122

The length and breadth of a rectangular field are in the ratio 5 : 3 and its perimeter is 480 m. The area of the field is

a 7200 m^2

b 13500 m^2

c 15000 m^2

d 54000 m^2

Solution:

b 13500 m^2

Let the length of the rectangular field be $5x$.

Breadth = $3x$

Perimeter of the field = $2(l + b)$ = 480 m given

$\Rightarrow 480 = 2(5x + 3x) \Rightarrow 480 = 16x$

$\Rightarrow x = = 30$

∴ Length = $5x = 5 \times 30 = 150$ m

Breadth = $3x = 3 \times 30 = 90$ m

∴ Area of the rectangular park = 150 m × 90 m = 13500 m^2

Question:123

The length of a room is 15 m. The cost of carpeting it with a carpet 75 cm wide at Rs 50 per metre is Rs 6000. The width of the room is

a 6 m

b 8 m

c 13.4 m

d 18 m

Solution:

a 6 m

Total cost of carpeting = Rs 6000

Rate of carpeting = Rs 50 per m

∴ Length of the carpet = m = 120 m

∴ Area of the carpet = m^2 = 90 m^2 [since 75 cm =]

Area of the floor = Area of the carpet = 90 m^2

∴ Width of the room =

Question:124

The sides of a triangle measure 13 cm, 14 cm and 15 cm. Its area is

a 84 cm^2

b 91 cm^2

c 168 cm^2

d 182 cm^2

Solution:

a 84 cm^2

Let a = 13 cm, b = 14 cm and c = 15 cm

Then, s = = cm = 21 cm

∴ Area of the triangle = sq. units

= cm^2

= cm^2

= cm^2

= $2 \times 2 \times 3 \times 7$ cm^2

= 84 cm^2

Question:125

The base and height of a triangle are 12 m and 8 m respectively. Its area is

a 96 m^2

b 48 m^2

c m^2

d m^2

Solution:

b 48 m^2

Base = 12 m

Height = 8 m

Area of the triangle = sq. units

= m^2

= 48 m^2

Question:126

The area of an equilateral triangle is cm^2. The length of each of its sides is

a 3 cm

b 4 cm

c

d cm

Solution:

b 4 cm

Area of the equilateral triangle = cm^2

We know:

Area of an equilateral triangle = sq. units

∴ Side of the equilateral triangle = cm

= cm = cm = cm = 4 cm

Question:127

Each side of an equilateral triangle is 8 cm long. Its area is

a 32 cm^2

b 64 cm^2

c cm^2

d cm^2

Solution:

c cm^2

It is given that one side of an equilateral triangle is 8 cm.

∴ Area of the equilateral triangle = sq. units

= cm^2

= cm^2 = cm^2

Question:128

The height of an equilateral triangle is cm. Its area is

a cm^2

b cm^2

c cm^2

d cm^2

Solution:

b cm^2

Let ΔABC be an equilateral triangle with one side of the length *a* cm.

Diagonal of an equilateral triangle = cm

⇒

⇒ *a* = cm

Area of the equilateral triangle =

= cm^2 = cm^2 = cm^2

Question:129

One side of a parallelogram is 16 cm and the distance of this side from the opposite side is 4.5 cm. The area of the parallelogram is

a 36 cm^2

b 72 cm^2

c 18 cm^2

d 54 cm^2

Solution:

b 72 cm^2

Base of the parallelogram = 16 cm

Height of the parallelogram = 4.5 cm

∴ Area of the parallelogram = Base × Height

= 16×4.5 cm^2 = 72 cm^2

Question:130

The lengths of the diagonals of a rhombus are 24 cm and 18 cm respectively. Its area is

a 432 cm^2

b 216 cm^2

c 108 cm^2

d 144 cm^2

Solution:

b 216 cm^2

Length of one diagonal = 24 cm

Length of the other diagonal = 18 cm

∴ Area of the rhombus = × Product of the diagonals

= cm^2 = 216 cm^2

Question:131

The difference between the circumference and radius of a circle is 37 cm. The area of the circle is

a 111 cm^2

b 148 cm^2

c 154 cm^2

d 259 cm^2

Solution:

c 154 cm^2

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

Circumference =

Circumference - Radius = 37

∴

⇒

⇒ *r* = =

∴ Radius of the given circle is 7 cm.

∴ Area = = cm^2 = 154 cm^2

Question:132

The perimeter of the floor of a room is 18 m and its height is 3 m. What is the area of 4 walls of the room?

a 21 m^2

b 42 m^2

c 54 m^2

d 108 m^2

Solution:

c 54 m^2

Given:
Perimeter of the floor = $2(l + b) = 18$ m
Height of the room = 3 m

$\therefore$ Area of the four walls = $\{2(l + b) \times h\}$
= Perimeter × Height
= 18 m × 3 m = 54 m^2

Question:133
How many metres of carpet 63 cm wide will be required to cover the floor of a room 14 m by 9 m?

a 200 m
b 210 m
c 220 m
d 185 m
Solution:
a 200 m

Area of the floor of a room = 14 m × 9 m = 126 m^2

Width of the carpet = 63 cm = 0.63 m since 100 cm = 1 m

$\therefore$ Required length of the carpet =
=

Question:134
If the diagonal of a rectangle is 17 cm long and its perimeter is 46 cm, the area of the rectangle is

a 100 cm^2
b 110 cm^2
c 120 cm^2
d 150 cm^2
Solution:
c 120 cm^2

Let the length of the rectangle be x cm and the breadth be y cm.
Area of the rectangle = xy cm^2
Perimeter of the rectangle = $2(x + y) = 46$ cm given

$\Rightarrow 2(x + y) = 46$

$\Rightarrow (x + y) = \text{cm} = 23 \text{ cm}$

Diagonal of the rectangle = = 17 cm

$\Rightarrow$ = 17

Squaring both the sides, we get:

$\Rightarrow x^2 + y^2 = 17^2$

$\Rightarrow x^2 + y^2 = 289$

Now, $(x^2 + y^2) = (x + y)^2 - 2xy$

$\Rightarrow 2xy = (x + y)^2 - (x^2 + y^2)$

$= 23^2 - 289$

$= 529 - 289 = 240$

$\therefore xy = \text{cm}^2 = 120 \text{ cm}^2$

Question:135

If the ratio of the areas of two squares is 9 : 1, then the ratio of their perimeters is

a 2 : 1

b 3 : 1

c 3 : 2

d 4 : 1

Solution:

b 3:1

Let a side of the first square be *a* cm and that of the second square be *b* cm.

Then, their areas will be a^2 and b^2, respectively.

Their perimeters will be 4*a* and 4*b,* respectively.

According to the question:

$\Rightarrow \Rightarrow$

$\therefore$ Required ratio of the perimeters = = 3:1

Question:136

The ratio of the areas of two squares, one having its diagonal double that of the other, is

a 2 : 1
b 3 : 1
c 3 : 2
d 4 : 1

Solution:

d 4:1

Let the diagonals be $2d$ and d.

Area of the square = sq. units

Required ratio =

Question:137

The area of a rectangle 144 m long is the same as that of a square of side 84 m. The width of the rectangle is

a 7 m
b 14 m
c 49 m
d none of these

Solution:

c 49 m

Let the width of the rectangle be x m.

Given:

Area of the rectangle = Area of the square

$\Rightarrow$ Length $\times$ Width = Side $\times$ Side

$\Rightarrow (144 \times x) = 84 \times 84$

$\therefore$ Width (x) = m = 49 m

Hence, width of the rectangle is 49 m.

Question:138

The ratio of the area of a square of side a and that of an equilateral triangle of side a, is

a 2 : 1
b
c 4 : 3
d

Solution:

d

Let one side of the square and that of an equilateral triangle be the same, i.e. *a* units.

Then, Area of the square = Side^2 = $(a)^2$

Area of the equilateral triangle = =

∴ Required ratio =

Question:139

The area of a square is equal to the area of a circle. What is the ratio between the side of the square and the radius of the circle?

a

b

c

d

Solution:

a

Let the side of the square be *x* cm and the radius of the circle be *r* cm.

Area of the square = Area of the circle

⇒ x^2 =

∴ Side of the square (*x*) =

Required ratio =

=

Question:140

Each side of an equilateral triangle is equal to the radius of a circle whose area is 154 cm^2. The area of the triangle is

a

b

c

d

Solution:

b

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

Then, its area = cm^2

$\therefore$ = 154

$\Rightarrow$

$\Rightarrow r^2$ = = 49

$\Rightarrow r$ = cm = 7 cm

Side of the equilateral triangle = Radius of the circle

= 7 cm

$\therefore$ Area of the equilateral triangle = sq. units

= cm^2

= cm^2

Question:141

The area of a rhombus is 36 cm^2 and the length of one of its diagonals is 6 cm. The length of the second diagonal is

a 6 cm

b cm

c 12 cm

d none of these

Solution:

c 12 cm

Area of the rhombus = × Product of the diagonals

Given:

Length of one diagonal = 6 cm

Area of the rhombus = 36 cm^2

$\therefore$ Length of the other diagonal = cm = 12 cm

Question:142

The area of a rhombus is 144 cm^2 and one of its diagonals is double the other. The length of the longer diagonal is

a 12 cm

b 16 cm

c 18 cm

d 24 cm

Solution:

d 24 cm

Let the length of the shorter diagonal of the rhombus be x cm.

$\therefore$ Longer diagonal $= 2x$

Area of the rhombus = × Product of its diagonals

$\Rightarrow 144 =$

$\Rightarrow 144 = =$

$\therefore x =$ cm = 12 cm

$\therefore$ Length of the longer diagonal $= 2x$

$= 2 \times 12$ cm

= 24 cm

Question:143

The area of a circle is 24.64 m^2. The circumference of the circle is

a 14.64 m

b 16.36 m

c 17.60 m

d 18.40 m

Solution:

c 17.60 m

Let the radius of the circle be r m.

Area = m^2

$\therefore \ =24.64$

$\Rightarrow =24.64$

$\Rightarrow r^2 = = 7.84$

$\Rightarrow r = = 2.8$ m

$\Rightarrow$ Circumference of the circle = m

= m = 17.60 m

Question:144

The area of a circle is increased by 22 cm^2 when its radius is increased by 1 cm. The original radius of the circle is

a 6 cm
b 3.2 cm
c 3 cm
d 3.5 cm

Solution:

c 3 cm

Suppose the radius of the original circle is r cm.
Area of the original circle =

Radius of the circle = $(r+1)$ cm
According to the question:

⇒
⇒
⇒ [cancel from both the sides of the equation]
⇒
⇒
⇒ $2r = 7 - 1 = 6$
∴ r = cm = 3 cm
∴ Original radius of the circle = 3 cm

Question:145

The radius of a circular wheel is 1.75 m. How many revolutions will it make in travelling 11 km?

a 10
b 100
c 1000
d 10000

Solution:

c 1000

Radius of the wheel = 1.75 m
Circumference of the wheel =

= cm = $2 \times 22 \times 0.25$ 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 revolutions, i.e. 1000 revolutions.
∴ Required number of revolutions = 1000

Question:146
Find the area of a rectangular plot on side of which is 48 m and its diagonal 50 m.
Solution:
We know that all the angles of a rectangle are 90° and the diagonal divides the rectangle into two right angled triangles.
So, one side of the triangle will be 48 m and the diagonal, which is 50 m, will be the hypotenuse.
According to Pythagoras theorem:
$\text{Hypotenuse}^2 = \text{Base}^2 + \text{Perpendicular}^2$
Perpendicular =
Perpendicular = m
∴ Other side of the rectangular plot = 14 m

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

Question:147
A room is 9 m by 8 m by 6.5 m. It has one door of dimensions 2 m × 1.5 m and four windows each of dimensions 1.5 m × 1 m. Find the cost of painting the walls at Rs 50 per m^2.
Solution:
Length = 9 m
Breadth = 8 m
Height = 6.5 m

Area of the four walls = $\{2(l + b) \times h\}$ sq. units
$= \{29 + 8 \times 6.5\}\ m^2 = \{34 \times 6.5\}\ m^2 = 221\ m^2$
Area of one door = $2 \times 1.5\ m^2 = 3\ m^2$
Area of one window = $1.5 \times 1\ m^2 = 1.5\ m^2$
∴ Area of four windows = $4 \times 1.5\ m^2 = 6\ m^2$
Total area of one door and four windows = $3 + 6\ m^2$
$= 9\ m^2$
Area to be painted = $221 - 9\ m^2 = 212\ m^2$

Rate of painting = Rs 50 per m^2

Total cost of painting = Rs 212×50 = Rs 10600

Question:148

Find the area of a square, the length of whose diagonal is 64 cm.

Solution:

Given that the diagonal of a square is 64 cm.

Area of the square = sq. units.

$= cm^2 = cm^2 = 2048\ cm^2$

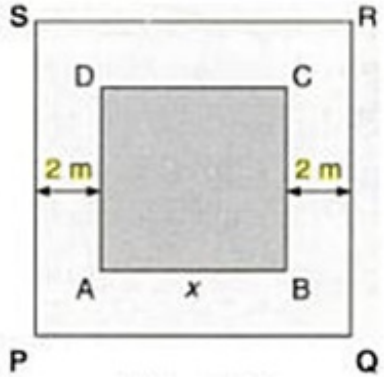
$\therefore$ Area of the square = 2048 cm^2

Question:149

A square lawn has a 2-m-wide path surrounding it. If the area of the path is 136 m^2, find the area of the lawn.

Solution:

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



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

Area of the square lawn = x^2

Length *PQ* = (*x* m + 2 m + 2 m) = (*x* + 4) m

$\therefore$ Area of *PQRS* = $(x + 4)^2 = (x^2 + 8x + 16)\ m^2$

Now, Area of the path = Area of *PQRS* – Area of the square lawn

$\Rightarrow 136 = x^2 + 8x + 16 - x^2$

$\Rightarrow 136 = 8x + 16$

$\Rightarrow 136 - 16 = 8x$

$\Rightarrow 120 = 8x$

$\therefore x = 120 \div 8 = 15$

$\therefore$ Side of the lawn = 15 m

∴ Area of the lawn = Side^2 = 15 m^2 = 225 m^2

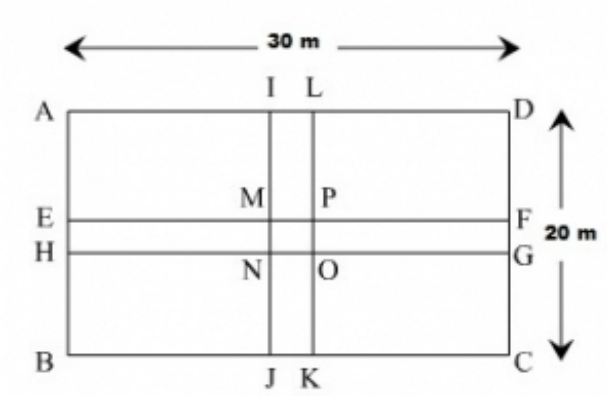
Question:150

A rectangular lawn is 30 m by 20 m. It has two roads each 2 m wide running in the middle of it, one parallel to the length and the other parallel to the breadth. Find the area of the roads.

Solution:

Let *ABCD* be the rectangular park.

EFGH and *IJKL* are the two rectangular roads with width 2 m.



Length of the rectangular park *AD* = 30 cm

Breadth of the rectangular park *CD* = 20 cm

Area of the road *EFGH* = 30 m × 2 m = 60 m^2

Area of the road *IJKL* = 20 m × 2 m = 40 m^2

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

∴ Area of *MNOP* = 2 m × 2 m = 4 m^2

∴ Area of the roads = Area (*EFGH*) + Area (I*JKL*) – Area (*MNOP*)

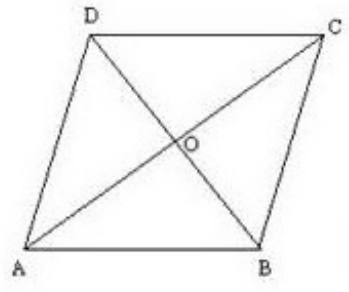
= 60 + 40 m^2 – 4 m^2 = 96 m^2

Question:151

Find the area of a rhombus having each side equal to 13 cm and one of the diagonals equal to 24 cm.

Solution:

Let ABCD be the rhombus whose diagonals intersect at O.



Then, AB = 13 cm

AC = 24 cm

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

Therefore, ΔAOB is a right-angled triangle, right angled at O, such that:

OA = AC = 12 cm

AB = 13 cm

By Pythagoras theorem:

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

$\Rightarrow 13^2 = 12^2 + OB^2$

$\Rightarrow OB^2 = 13^2 - 12^2$

$\Rightarrow OB^2 = 169 - 144 = 25$

$\Rightarrow OB^2 = 25^2$

$\Rightarrow OB = 5$ cm

$\therefore BD = 2 \times OB = 2 \times 5$ cm $= 10$ cm

$\therefore$ Area of the rhombus ABCD $=$ $\times AC \times BD$ cm^2

$=$ $cm^2 = 120$ cm^2

Question:152

The area of a parallelogram is 3385 m^2. If its altitude is twice the corresponding base, find the base and the altitude.

Solution:

Let the base of the parallelogram be x m.

Then, the altitude of the parallelogram will be $2x$ m.

It is given that the area of the parallelogram is 338 m^2.

Area of a parallelogram = Base × Altitude

$\therefore 338\ m^2 = x \times 2x$

$338\ m^2 = 2x^2$

$\Rightarrow x^2 = m^2 = 169\ m^2$

$\Rightarrow x^2 = 169\ m^2$

$\Rightarrow x = 13$ m

$\therefore$ Base = $x\ m = 13$ m

Altitude = $2x\ m = 2 \times 13$m = 26 m

Question:153

Find the area of a right triangle having base = 24 cm and hypotenuse = 25 cm.

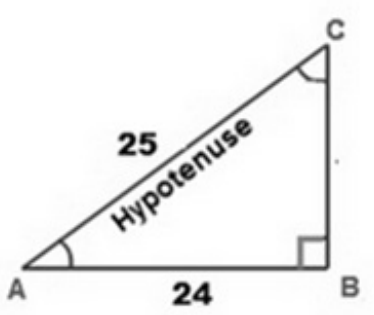
Solution:

Consider ΔABC.

Here, $\angle B = 90°$

AB = 24 cm

AC = 25 cm



Now, $AB^2 + BC^2 = AC^2$

$\Rightarrow BC^2 = AC^2 - AB^2$

$= (25^2 - 24^2)$

$= 625 - 576$

$= 49$

$\Rightarrow$ BC = cm = 7 cm

Area of ΔABC = sq. units

= $cm^2 = 84\ cm^2$

Hence, area of the right angled triangle is 84 cm^2.

Question:154

The radius of the wheel of a car is 35 cm. How many revolutions will it make to travel 33 km?

Solution:

Radius of the wheel = 35 cm

Circumference of the wheel =

= cm = 44×5 cm = 220 cm

= m = m

Distance covered by the wheel in 1 revolution = m

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

Thus, 33 × 1000 m will be covered by the car in revolutions, i.e. 15000 revolutions.
∴ Required number of revolutions = 15000

Question:155

Find the radius of a circle whose area is 616 cm^2.

Solution:

Let the radius of the circle be r cm.
∴ Area = cm^2
∴ = 616
⇒ = 616
⇒ r^2 = = 196
⇒ r = = 14 cm
Hence, the radius of the given circle is 14 cm.

Question:156

Mark ✓ against the correct answer

The area of a circle is 154 cm^2. Its diameter is

a 14 cm
b 11 cm
c 7 cm
d 22 cm

Solution:

a 14 cm

Let the radius of the circle be r cm.
Then, its area will be cm^2.
∴ = 154
⇒ = 154
⇒ r^2 = = 49
⇒ r = = 7 cm
∴ Diameter of the circle = 2r = 2 × 7 cm = 14 cm

Question:157

Mark ✓ against the correct answer

The circumference of a circle is 44 cm. Its area is

a 308 cm^2

b 154 cm^2

c 77 cm^2

d 616 cm^2

Solution:

b 154 cm^2

Let the radius of the circle be r cm.

Circumference = cm

$\therefore$ = 44

$\Rightarrow$

$\Rightarrow r$ = = 7 cm

$\therefore$ Area of the circle =

= cm^2 = 154 cm^2

Question:158

Mark ✓ against the correct answer

Each diagonal of a square is 14 cm long. Its area is

a 196 cm^2

b 88 cm^2

c 98 cm^2

d 147 cm^2

Solution:

c 98 cm^2

Given that the diagonal of a square is 14 cm.

Area of a square = sq. units.

= cm^2 = cm^2 = 98 cm^2

Hence, area of the square is 98 cm^2.

Question:159

Mark ✓ against the correct answer

The area of a square is 50 cm^2. The length of its diagonal is

a cm

b 10 cm

c cm

d 8 cm

Solution:

b 10 cm

Given that the area of the square is 50 cm^2.

We know:

Area of a square = sq. units

∴ Diagonal of the square = = cm = cm = 10 cm

Hence, the diagonal of the square is 10 cm.

Question:160

Mark ✓ against the correct answer

The length and breadth of a rectangular park are in the ratio 4 : 3 and its perimeter is 56 m. The area of the field is

a 192 m^2

b 300 m^2

c 432 m^2

d 228 m^2

Solution:

a 192 m^2

Let the length of the rectangular park be 4*x*.

∴ Breadth = 3*x*

Perimeter of the park = 2(*l* + *b*) = 56 m given

⇒ 56 = 2(4*x* + 3*x*)

⇒ 56 = 14*x*

⇒ *x* = = 4

Length = 4*x* = 4 × 4 = 16 m

Breadth = 3*x* = 3 × 4 = 12 m

∴ Area of the rectangular park = 16 m × 12 m = 192 m^2

Question:161

Mark ✓ against the correct answer

The sides of triangle are 13 cm, 14 cm and 15 cm. The area of the triangle is

a $84\ cm^2$

b $91\ cm^2$

c $105\ cm^2$

d $97.5\ cm^2$

Solution:

a $84\ cm^2$

Let $a = 13$ cm, $b = 14$ cm and $c = 15$ cm

$s = =$ cm $= 21$ cm

$\therefore$ Area of the triangle = sq. units

$= cm^2$

$= \ cm^2$

$= cm^2$

$= 2 \times 2 \times 3 \times 7\ cm^2 = 84\ cm^2$

Question:162

Mark ✓ against the correct answer

Each side of an equilateral triangle is 8 cm. Its area is

a

b

c

d

Solution:

a

Given that each side of an equilateral triangle is 8 cm.

$\therefore$ Area of the equilateral triangle = sq. units

$= \ cm^2$

$= cm^2 = cm^2$

Question:163

Mark ✓ against the correct answer

One side of a parallelogram is 14 cm and the distance of this side from the opposite side is 6.5 cm. The area of the parallelogram is

a 45.5 cm^2

b 91 cm^2

c 182 cm^2

d 190 cm^2

Solution:

b 91 cm^2

Base = 14 cm

Height = 6.5 cm

∴ Area of the parallelogram = Base × Height

= 14 × 6.5 cm^2

= 91 cm^2

Question:164

Mark ✓ against the correct answer

The lengths of the diagonals of a rhombus are 18 cm and 15 cm. The area of the rhombus is

a 270 cm^2

b 135 cm^2

c 90 cm^2

d 180 cm^2

Solution:

b 135 cm^2

Area of the rhombus = × Product of the diagonals

= cm^2 = 135 cm^2

Hence, the area of the rhombus is 135 cm^2.

Question:165

Fill in the blanks.

i If d_1 and d_2 be the diagonals of a rhombus, then its are is ..... sq units.

ii If *l*,*b* and *h* be the length, breadth and height respectively of a room, then area of its 4 walls = ... sq units.

iii 1 hectare = ... m^2.

iv 1 are = ...m^2.

v If each side of a triangle is a cm, then its area = ... cm^2.

Solution:

i If d_1 and d_2 be the diagonals of a rhombus, then its area is sq. units.

Area of a rhombus = × Product of its diagonals

ii If l, b and h are the length, breadth and height respectively of a room, then area of its 4 walls = $\underline{2h(l + b)}$ sq. units.

iii 1 hectare = $\underline{10000}$ m^2

since 1 hectometre = 100 m

∴1 hectare = 100 × 100 m^2

iv 1 acre = $\underline{100}$ m^2

v If each side of a triangle is a cm, then its area = cm^2.

Area of equilateral triangle with side a = sq. units.

Question:166

Write 'T' for true and 'F' for false

i Area of a triangle = base × height

ii Area of a || gm = base × height

iii Area of a circle =

iv Circumference of a circle =

Solution:

i F

Area of a triangle =

ii T

Area of a parallelogram = Base × Height

iii F

Area of a circle =

iv T

Circumference of a circle =