Question:1

Find the area, in square metres, of a rectangle whose

i Length = 5.5 m, breadth = 2.4 m

ii Length = 180 cm, breadth = 150 cm

Solution:

We have,

i Length = 5.5 m, Breadth = 2.4 m

Therefore,

Area of rectangle = Length x Breadth

= 5.5 m x 2.4 m

= 13.2 m^2

ii Length = 180 cm = 1.8 m, Breadth = 150 cm = 1.5 m

$$Since 100cm = 1m$$

Therefore,

Area of rectangle = Length x Breadth

= 1.8 m x 1.5 m

= 2.7 m^2

Question:2

Find the area, in square centimetres, of a square whose side is

i 2.6 cm

ii 1.2 dm

Solution:

We have,

i Side of the square = 2.6 cm

Therefore, area of the square = $Side^2$

= $2.6cm^2$ = 6.76 cm^2

ii Side of the square = 1.2 dm = 1.2 x 10 cm = 12 cm

$$Since 1dm = 10cm$$

Therefore, area of the square = $Side^2$

= $12cm^2$ = 144 cm^2

Question:3

Find in square metres, the area of a square of side 16.5 dam.

Solution:

We have,

Side of the square = 16.5 dam = 16.5 x 10 m = 165 m

$$Since 1dam = 10m$$

Area of the square = $Side^2 = 165m^2$

= 27225 m^2

Question:4

Find the area of a rectangular feild in ares whose sides are:

i 200 m and 125 m

ii 75 m 5 dm and 125 m

Solution:

We have,

i Length of the rectangular field = 200 m

Breadth of the rectangular field = 125 m

Therefore,

Area of the rectangular field = Length x Breadth

= 200 m x 125 m

= 25000 m^2 = 250 ares [Since 100 m^2 = 1 are]

ii Length of the rectangular field =75 m 5 dm = $75 + 0.5$ m = 75.5 m

$$Since 1dm = 10cm = 0.1m$$

Breadth of the rectangular field = 120 m

Therefore,

Area of the rectangular field = Length x Breadth

= 75.5 m x 120 m

= 9060 m^2 = 90.6 ares [Since 100 m^2 = 1 are]

Question:5

Find the area of a rectangular field in hectares whose sides are:

i 125 m and 400 m

ii 75 m 5 dm and 120 m

Solution:

We have,

i Length of the rectangular field = 125 m

Breadth of the rectangular field = 400 m

Therefore,

Area of the rectangular field = Length x Breadth

= 125 m x 400 m

= 50000 m^2 = 5 hectares [Since 10000 m^2 = 1 hectare]

ii Length of the rectangular field =75 m 5 dm = $75 + 0.5$ m = 75.5 m

$$Since 1dm = 10cm = 0.1m$$

Breadth of the rectangular field = 120 m

Therefore,

Area of the rectangular field = Length x Breadth

= 75.5 m x 120 m

= 9060 m^2 = 0.906 hectares [Since 10000 m^2 = 1 hectare]

Question:6

A door of dimensions 3 m × 2m is on the wall of dimension 10 m × 10 m. Find the cost of painting the wall if rate of painting is Rs 2.50 per sq. m.

Solution:

We have,

Length of the door = 3 m

Breadth of the door = 2 m

Side of the wall = 10 m

Area of the wall = Side x Side = 10 m x 10 m = 100 m^2

Area of the door = Length x Breadth = 3 m x 2 m = 6 m^2

Thus,

Required area of the wall for painting = Area of the wall – Area of the door = $100 - 6$ m^2 = 94 m^2

Rate of painting per square metre = Rs. 2.50

Hence, the cost of painting the wall = Rs. $94x2.50$= Rs. 235

Question:7

A wire is in the shape of a rectangle. Its length is 40 cm and breadth is 22 cm. If the same wire is

bent in the shape of a square, what will be the measure of each side. Also, find which side encloses more area?

Solution:

We have,

Perimeter the of rectangle = $2Length + Breadth$

$= 240cm + 22cm$ = 124 cm

It is given that the wire which was in the shape of a rectangle is now bent into a square.

Therefore, the perimeter of the square = Perimeter of the rectangle

=> Perimeter of the square = 124 cm

⇒ 4 x side = 124 cm

∴ Side = $\frac{124}{4} = 31 \text{ cm}$

Now,

Area of the rectangle = 40 cm x 22 cm = 880 cm^2

Area of the square = $Side^2 = 31cm^2$ = 961 cm^2

Therefore, the square-shaped wire encloses more area.

Question:8

How many square metres of glass will be required for a window, which has 12 panes, each pane measuring 25 cm by 16 cm?

Solution:

We have,

Length of the glass pane = 25 cm

Breadth of the glass pane = 16 cm

Area of one glass pane = 25 cm x 16 cm = 400 cm^2 = 0.04 m^2 [Since 1 m^2 = 10000 cm^2]

Thus,

Area of 12 such panes = 12 x 0.04 = 0.48 m^2

Question:9

A marble tile measures 10 cm × 12 cm. How many tiles will be required to cover a wall of size 3 m × 4 m? Also, find the total cost of the tiles at the rate of Rs 2 per tile.

Solution:

We have,

Area of the wall = 3 m x 4 m = 12 m^2

Area of one marble tile = 10 cm x 12 cm = 120 cm^2 = 0.012 m^2 [Since 1 m^2 = 10000 cm^2]

Thus,

Number of tiles = $\frac{\text{Area of wall}}{\text{Area of one tile}} = \frac{12 \text{ m}^2}{0.012 \text{ m}^2} = 1000$

Cost of one tile = Rs. 2

Total cost = Number of tiles x Cost of one tile

= Rs. $1000x2$= Rs. 2000

Question:10

A table top is 9 dm 5 cm long 6 dm 5 cm broad. What will be the cost to polish it at the rate of 20 paise per square centimetre?

Solution:

We have,

Length of the table top = 9 dm 5 cm = $9x10+5$ cm = 95 cm

$$Since 1dm = 10cm$$

Breadth of the table top = 6 dm 5 cm = $6x10+5$ cm = 65 cm

∴ Area of the table top = Length x Breadth = $95cmx65cm$= 6175 cm^2

Rate of polishing per square centimetre = 20 paise = Rs. 0.20

Total cost = Rs. $6175x0.20$= Rs. 1235

Question:11

A room is 9.68 m long and 6.2 m wide. Its floor is to be covered with rectangular tiles of size 22 cm by 10 cm. Find the total cost of the tiles at the rate of Rs 2.50 per tile.

Solution:

We have,

Length of the floor of the room = 9.68 m

Breadth of the floor of the room = 6.2 m

Area of the floor = 9.68 m x 6.2 m = 60.016 m^2

Length of the tile = 22 cm

Breadth of the tile = 10 cm

Area of one tile = 22 cm x 10 cm = 220 cm^2 = 0.022 m^2 [Since 1 m^2 = 10000 cm^2]

Thus,

Number of tiles = $\frac{60.016\ \mathrm{m^2}}{0.022\ \mathrm{m^2}} = 2728$

Cost of one tile = Rs. 2.50

Total cost = Number of tiles x Cost of one tile

= Rs. $2728x2.50$= Rs. 6820

Question:12

One side of a square field is 179 m. Find the cost of raising a lown on the field at the rate of Rs 1.50 per square metre.

Solution:

We have,
Side of the square field = 179 m
Area of the field = $Side^2$ = $179m^2$ = 32041 m^2
Rate of raising a lawn on the field per square metre = Rs. 1.50
Thus,
Total cost of raising a lawn on the field = Rs.$32041x1.50$= Rs. 48061.50

Question:13

A rectangular field is measured 290 m by 210 m. How long will it take for a girl to go two times round the field, if she walks at the rate of 1.5 m/sec?

Solution:

We have,
Length of the rectangular field = 290 m
Breadth of the rectangular field = 210 m
Perimeter of the rectangular field = $2Length + Breadth$
= $2290 + 210$= 1000 m
Distance covered by the girl = 2 x Perimeter of the rectangular field
= 2 x 1000 = 2000 m

The girl walks at the rate of 1.5 m/sec.
or,
Rate = 1.5 x 60 m/min = 90 m/min
Thus,
Required time to cover a distance of 2000 m = $\frac{2000\text{ m}}{90\text{ m/ min}} = 22\frac{2}{9}\min$
Hence, the girl will take $22\frac{2}{9}\min$ to go two times around the field.

Question:14

A corridor of a school is 8 m long and 6 m wide. It is to be covered with convas sheets. If the available canvas sheets have the size 2 m × 1 m, find the cost of canvas sheets required to cover the corridor at the rate of Rs 8 per sheet.

Solution:

We have,
Length of the corridor = 8 m
Breadth of the corridor = 6 m
Area of the corridor of a school = Length x Breadth = $8mx6m$= 48 m^2
Length of the canvas sheet = 2 m
Breadth of the canvas sheet = 1 m
Area of one canvas sheet = Length x Breadth = $2mx1m$= 2 m^2

Thus,

Number of canvas sheets = $\frac{48\ \mathrm{m}^2}{2\ \mathrm{m}^2} = 24$

Cost of one canvas sheet = Rs. 8

∴ Total cost of the canvas sheets = Rs. $24x8$ = Rs. 192

Question:15

The length and breadth of a playground are 62 m 60 cm and 25 m 40 cm respectively. Find the cost of turfing it at Rs 2.50 per square metre. How long will a man take to go three times round the field, if he walks at the rate of 2 metres per second.

Solution:

We have,

Length of a playground = 62 m 60 cm = 62.6 m

$$Since 10cm = 0.1m$$

Breadth of a playground = 25 m 40 cm = 25.4 m

Area of a playground = Length x Breadth= 62.6 m x 25.4 m = 1590.04 m^2

Rate of turfing = Rs. 2.50/m^2

∴ Total cost of turfing = Rs. $1590.04x2.50$= Rs. 3975.10

Again,

Perimeter of a rectangular field = $2Length + Breadth$

$= 262.6 + 25.4$= 176 m

Distance covered by the man in 3 rounds of a field = 3 x Perimeter of a rectangular field

= 3 x 176 m = 528 m

The man walks at the rate of 2 m/sec.

or,

Rate = 2 x 60 m/min = 120 m/min

Thus,

Required time to cover a distance of 528 m = $\frac{528\ \mathrm{m}}{120\ \mathrm{m/min}} = 4.4\ \mathrm{min}$

= 4 minutes 24 seconds

$$since 0.1minutes = 6seconds$$

Question:16

A lane 180 m long and 5 m wide is to be paved with bricks of length 20 cm and breadth 15 cm. Find the cost of bricks that are required, at the rate of Rs 750 per thousand.

Solution:

We have,

Length of the lane = 180 m

Breadth of the lane = 5 m

Area of a lane = Length x Breadth = 180 m x 5 m = 900 m^2

Length of the brick = 20 cm

Breadth of the brick = 15 cm

Area of a brick = Length x Breadth = 20 cm x 15 cm = 300 cm^2 = 0.03 m^2 [Since 1 m^2 = 10000 cm^2]

Required number of bricks = $\frac{900\ \mathrm{m^2}}{0.03\ \mathrm{m^2}} = 30000$

Cost of 1000 bricks = Rs. 750

∴ Total cost of 30,000 bricks = Rs. $\left(\frac{750 \times 30{,}000}{1000}\right) = \mathrm{Rs.}\ 22,500$

Question:17

How many envelopes can be made out of a sheet of paper 125 cm by 85 cm; supposing one envelope requires a piece of paper of size 17 cm by 5 cm?

Solution:

We have,

Length of the sheet of paper = 125 cm

Breadth of the sheet of paper = 85 cm

Area of a sheet of paper = Length x Breadth = 125 cm x 85 cm = 10,625 cm^2

Length of sheet required for an envelope = 17 cm

Breadth of sheet required for an envelope = 5 cm

Area of the sheet required for one envelope = Length x Breadth = 17 cm x 5 cm = 85 cm^2

Thus,

Required number of envelopes = $\frac{10{,}625\ \mathrm{cm^2}}{85\ \mathrm{cm^2}} = 125$

Question:18

The width of a cloth is 170 cm. Calculate the length of the cloth required to make 25 diapers, if each diaper requires a piece of cloth of size 50 cm by 17 cm.

Solution:

We have,

Length of the diaper = 50 cm

Breadth of the diaper = 17 cm

Area of cloth to make 1 diaper = Length x Breadth = 50 cm x 17 cm = 850 cm^2

Thus,

Area of 25 such diapers = $25x850 cm^2$ = 21,250 cm^2

Area of total cloth = Area of 25 diapers

= 21,250 cm^2

It is given that width of a cloth = 170 cm

$\therefore$ Length of the cloth = $\frac{\text{Area of cloth}}{\text{Width of a cloth}} = \frac{21{,}250 \text{ cm}^2}{170 \text{ cm}} = 125 \text{ cm}$

Hence, length of the cloth will be 125 cm.

Question:19

The carpet for a room 6.6 m by 5.6 m costs Rs 3960 and it was made from a roll 70 cm wide. Find the cost of the carpet per metro.

Solution:

We have,

Length of a room = 6.6 m

Breadth of a room = 5.6 m

Area of a room = Length x Breadth = 6.6 m x 5.6 m = 36.96 m^2

Width of a carpet = 70 cm = 0.7 m

$$Since 1m = 100cm$$

Length of a carpet = $\frac{\text{Area of a room}}{\text{Width of a carpet}} = \frac{36.96 \text{ m}^2}{0.7 \text{ m}} = 52.8 \text{ m}$

Cost of 52.8 m long roll of carpet = Rs. 3960

Therefore,

Cost of 1 m long roll of carpet = Rs. $\frac{3960}{52.8} = \text{Rs. } 75$

Question:20

A room is 9 m long, 8 m broad and 6.5 m high. It has one door of dimensions 2 m × 1.5 m and three windows each of dimensions 1.5 m × 1 m. Find the cost of white washing the walls at Rs 3.80 per square metre.

Solution:

We have,

Length of a room = 9 m

Breadth of a room = 8 m

Height of a room = 6.5 m

Area of 4 walls = $2l + b$h

= $29m + 8m$ x 6.5 m = 2 x 17 m x 6.5 m = 221 m^2

Length of a door = 2 m

Breadth of a door = 1.5 m

Area of a door = Length x Breadth = 2 m x 1.5 m = 3 m^2

Length of a window = 1.5 m

Breadth of a window = 1 m

Since, area of one window = Length x Breadth = 1.5 m x 1 m = 1.5 m^2

Thus,

Area of 3 such windows = 3 x 1.5 m^2 = 4.5 m^2

Area to be white-washed = Area of 4 walls – $Areaofonedoor + Areaof3windows$

Area to be white-washed = [221 – (3 + 4.5)] m^2

= $221 - 7.5\,m^2$ = 213.5 m^2

Cost of white-washing for 1 m^2 area = Rs. 3.80

∴ Cost of white-washing for 213.5 m^2 area = Rs. $213.5x3.80$= Rs. 811.30

Question:21

A hall 36 m long and 24 m broad allowing 80 m^2 for doors and windows, the cost of papering the walls at Rs 8.40 per m^2 is Rs 9408. Find the height of the hall.

Solution:

We have,

Length of the hall = 36 m

Breadth of the hall = 24 m

Let h be the height of the hall.

Now, in papering the wall, we need to paper the four walls excluding the floor and roof of the hall.

So, the area of the wall which is to be papered = Area of 4 walls

= 2h$l + b$

= 2h $36 + 24$ = 120h m^2

Now, area left for the door and the windows = 80 m^2

So, the area which is actually papered = $120h - 80\,m^2$

Again,

The cost of papering the walls at Rs 8.40 per m^2 = Rs. 9408.

⇒ $120h - 80\,m^2$ x Rs. 8.40 per m^2 = Rs. 9408

⇒ (120h – 80) m^2 = $\frac{\text{Rs. } 9408}{\text{Rs. } 8.40}$

⇒ $120h - 80\,m^2$ = 1120 m^2

⇒ 120h m^2 = $1120 + 80\,m^2$

⇒ 120h m^2 = 1200 m^2

$\therefore$ h $= \frac{1200 \text{ m}^2}{120 \text{ m}} = 10 \text{ m}$

Hence, the height of the wall would be 10 m.

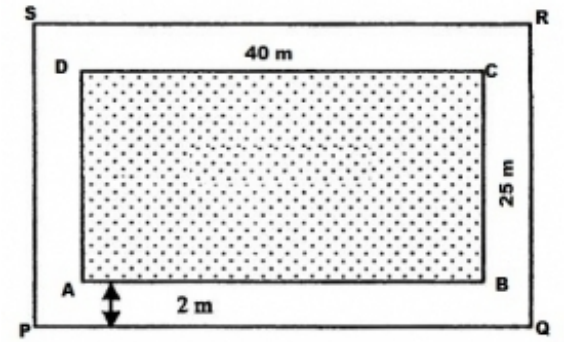
Question:22

A rectangular grassy lawn measuring 40 m by 25 m is to be surrounded externally by a path which is 2 m wide. Calculate the cost of levelling the path at the rate of Rs 8.25 per square metre.

Solution:

We have,

Length *AB* = 40 m and breadth *BC* = 25 m



$\therefore$ Area of lawn *ABCD* = 40 m x 25 m = 1000 m^2

Length *PQ* = $40 + 2 + 2$ m = 44 m

Breadth *QR* = $25 + 2 + 2$ m = 29 m

$\therefore$ Area of *PQRS* = 44 m x 29 m = 1276 m^2

Now,

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

= 1276 m^2 – 1000 m^2

= 276 m^2

Rate of levelling the path = Rs. 8.25 per m^2

$\therefore$ Cost of levelling the path = Rs. $8.25x276$

= Rs. 2277

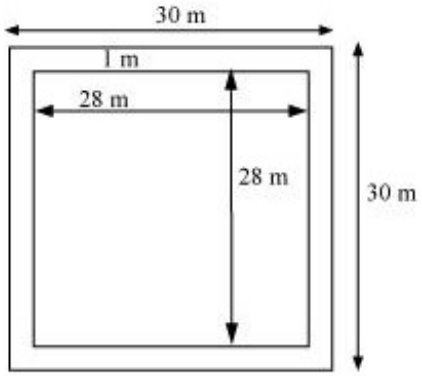
Question:23

One metre wide path is built inside a square park of side 30 m along its sides. The remaining part of the park is covered by grass. If the total cost of covering by grass is Rs 1176, find the rate per square metre at which the park is covered by the grass.

Solution:

We have,

The side of the square garden (*a*) = 30 m



∴ Area of the square garden including the path = $a^2 = 30^2 = 900$ m^2

From the figure, it can be observed that the side of the square garden, when the path is not included, is 28 m.

Area of the square garden not including the path = $28^2 = 784$ m^2

Total cost of covering the park with grass = Area of the park covering with green grass x Rate per square metre

1176 = 784 x Rate per square metre

∴ Rate per square metre at which the park is covered with grass = Rs. $1176 \div 784$

= Rs. 1.50

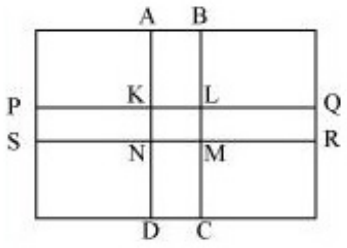
Question:24

Through a rectangular field of sides 90 m × 60 m, two roads are constructed which are parallel to the sides and cut each other at right angles through the centre of the field. If the which of the road is 3 m, find the total area cobered by the two roads.

Solution:

We have,

Length of the rectangular field = 90 m and breadth of the rectangular field = 60 m



∴ Area of the rectangular field = 90 m x 60 m = 5400 m^2

Area of the road *PQRS* = 90 m x 3 m = 270 m^2

Area of the road *ABCD* = 60 m x 3 m = 180 m^2

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

Thus, area of KLMN = 3 m x 3 m = 9 m^2

Hence,

Area of the roads = Area (*PQRS*) + Area (*ABCD*) – Area (*KLMN*)

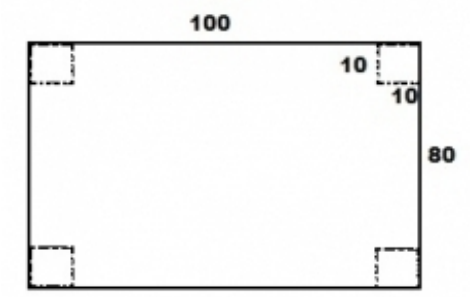
= $270 + 180$m^2 – 9 m^2 = 441 m^2

Question:25

From a rectangular sheet of tin, of size 100 cm by 80 cm, are cut four squares of side 10 cm from each corner. Find the area of the remaining sheet.

Solution:

We have,



Length of the rectangular sheet = 100 cm

Breadth of the rectangular sheet = 80 cm

Area of the rectangular sheet of tin = 100 cm x 80 cm = 8000 cm^2

Side of the square at the corner of the sheet = 10 cm

Area of one square at the corner of the sheet = $10cm^2$ = 100 cm^2

∴ Area of 4 squares at the corner of the sheet = 4 x 100 cm^2 = 400 cm^2

Hence,

Area of the remaining sheet of tin =Area of the rectangular sheet – Area of the 4 squares

Area of the remaining sheet of tin = (8000 – 400) cm^2

= 7600 cm^2

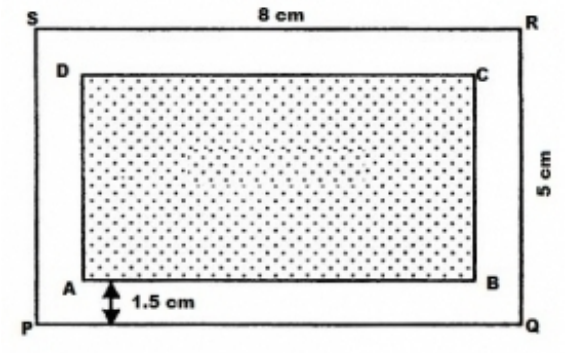
Question:26

A painting 8 cm long and 5 cm wide is painted on a cardboard such that there is a margin of 1.5 cm along each of its sides. Fund the total area of the margin.

Solution:

We have,

Length of the cardboard = 8 cm and breadth of the cardboard = 5 cm



∴ Area of the cardboard including the margin = 8 cm x 5 cm = 40 cm^2

From the figure, it can be observed that,

New length of the painting when the margin is not included = 8 cm – $1.5cm + 1.5cm$= $8 - 3$ cm = 5

cm

New breadth of the painting when the margin is not included = 5 cm – $1.5cm + 1.5cm$ = $5 - 3$ cm = 2 cm

∴ Area of the painting not including the margin = 5 cm x 2 cm = 10 cm^2

Hence,

Area of the margin = Area of the cardboard including the margin – Area of the painting

= $40 - 10$ cm^2

= 30 cm^2

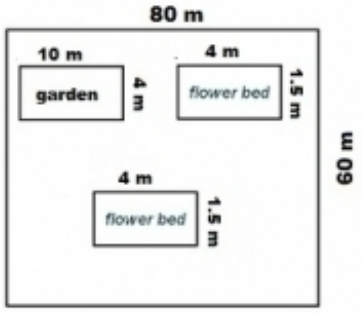
Question:27

Rakesh has a rectangular field of length 80 m and breadth 60 m. In it, he wants to make a garden 10 m long and 4 m broad at one of the corners and at another corner, he wants to grow flowers in two floor-beds each of size 4 m by 1.5 m. In the remaining part of the field, he wants to apply mansures. Find the cost of applying the manures at the rate of Rs 300 per are.

Solution:

Length of the rectangular field = 80 m

Breadth of the rectangular field = 60 m



∴ Area of the rectangular field = 80 m x 60

= 4800 m^2

Again,

Area of the garden = 10 m x 4 m = 40 m^2

Area of one flower bed = 4 m x 1.5 m = 6 m^2

Thus,

Area of two flower beds = 2 x 6 m^2 = 12 m^2

Remaining area of the field for applying manure = Area of the rectangular field – $Areaofthegarden + Areaofthetwoflowerbeds$

Remaining area of the field for applying manure = 4800 m^2 – $40 + 12$ m^2

= $4800 - 52 m^2$

= 4748 m^2

Since 100 m^2 = 1 are

∴ 4748 m^2 = 47.48 ares

So, cost of applying manure at the rate of Rs. 300 per are will be Rs. $300x47.48$= Rs. 14244

Question:28

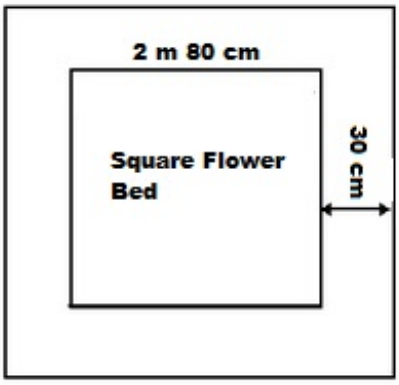
Each side of a square flower bed is 2 m 80 cm long. It is extended by digging a strip 30 cm wide all around it. Find the area of the enlarged flower bed and also the increase in the area of the flower bed.

Solution:

We have,

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

$$= 2.80 + 0.3 + 0.3\text{m} = 3.4 \text{ m}$$

Area of the enlarged flower bed with the digging strip = $Side^2$ = 3.4^2 = 11.56 m^2

Thus,

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

= 3.72 m^2

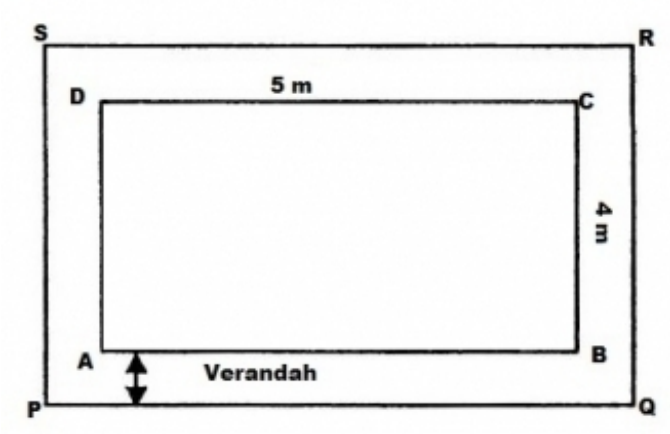
Question:29

A room 5 m long and 4 m wide is surrounded by a verandah. If the verandah occupies an area of 22 m^2, find the width of the varandah.

Solution:

Let the width of the verandah be *x* m.

Length of the room AB = 5 m and BC = 4 m



$\therefore$ Area of the room = 5 m x 4 m = 20 m^2

Length of the verandah $PQ = (5 + x + x) = (5 + 2x)$ m

Breadth of the verandah $QR = (4 + x + x) = (4 + 2x)$ m

Area of verandah $PQRS = (5 + 2x) \times (4 + 2x) = (4x^2 + 18x + 20)$ m^2

$\therefore$ Area of verandah = Area of $PQRS$ – Area of $ABCD$

$\Rightarrow 22 = 4x^2 + 18x + 20 - 20$

$\Rightarrow 22 = 4x^2 + 18x$

$\Rightarrow 11 = 2x^2 + 9x$

$\Rightarrow 2x^2 + 9x - 11 = 0$

$\Rightarrow 2x^2 + 11x - 2x - 11 = 0$

$\Rightarrow x(2x + 11) - 1(2x + 11) = 0$

$\Rightarrow (x - 1)(2x + 11) = 0$

When $x - 1 = 0$, $x = 1$

When $2x + 11 = 0$, $x = -\frac{11}{2}$

The width cannot be a negative value.

So, width of the verandah = $x = 1$ m.

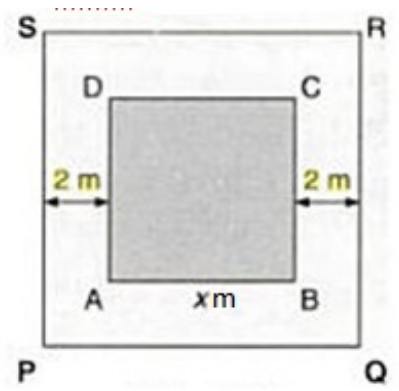
Question:30

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:

We have,

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



Let 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

∴ 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

⇒ $136 = x^2 + 8x + 16 - x^2$

⇒ $136 = 8x + 16$

⇒ $136 - 16 = 8x$

⇒ $120 = 8x$

∴ $x = 120 \div 8 = 15$

∴ Side of the lawn = 15 m

Hence,

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

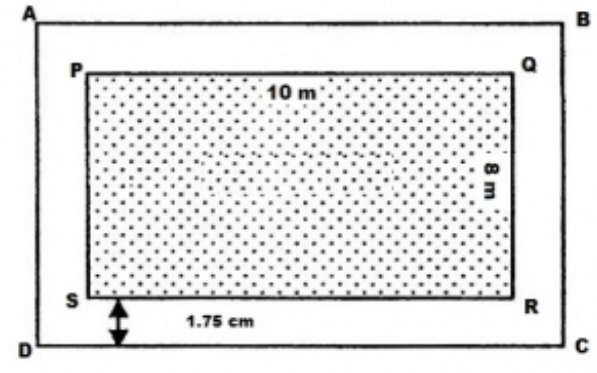
Question:31

A poster of size 10 cm by 8 cm is pasted on a sheet of cardboard such that there is a margin of width 1.75 cm along each side of the poster. Find i the total area of the margin ii the cost of the cardboard used at the rate of Re 0.60 per cm^2.

Solution:

We have,

Length of the poster = 10 cm and breadth of the poster = 8 cm



∴ Area of the poster = Length x Breadth = 10 cm x 8 cm = 80 cm^2

From the figure, it can be observed that,

Length of the cardboard when the margin is included = 10 cm + 1.75 cm + 1.75 cm = 13.5 cm

Breadth of the cardboard when the margin is included = 8 cm + 1.75 cm + 1.75 cm = 11.5 cm

$\therefore$ Area of the cardboard = Length x Breadth = 13.5 cm x 11.5 cm = 155.25 cm^2

Hence,

i Area of the margin = Area of cardboard including the margin – Area of the poster

= 155.25 cm^2 – 80 cm^2

= 75.25 cm^2

ii Cost of the cardboard = Area of the cardboard x Rate of the cardboard Rs. 0.60 per cm^2

= Rs. $155.25x0.60$

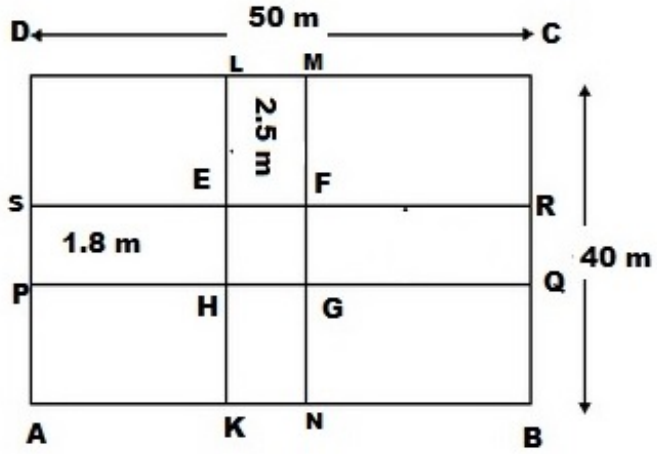
= Rs. 93.15

Question:32

A rectangulr 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 shorter roads are 1.8 m and 2.5 m respectively. Find the area of the roads and the erea of the remaining portion of the field.

Solution:

Let *ABCD* be the rectangular field and *KLMN* and *PQRS* the two rectangular roads with width 1.8 m and 2.5 m, respectively.



Length of the rectangular field *CD* = 50 cm and breadth of the rectangular field *BC* = 40 m

$\therefore$ Area of the rectangular field *ABCD* = 50 m x 40 m = 2000 m^2

Area of the road *KLMN* = 40 m x 2.5 m = 100 m^2

Area of the road *PQRS* = 50 m x 1.8 m = 90 m^2

Clearly area of *EFGH* is common to the two roads.

Thus, Area of *EFGH* = 2.5 m x 1.8 m = 4.5 m^2

Hence,

Area of the roads = Area (*KLMN*) + Area (*PQRS*) – Area (*EFGH)*

= (100 m^2 + 90 m^2) – 4.5 m^2 = 185.5 m^2

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

$$= 2000 - 185.5 \text{m}^2$$

$$= 1814.5 \text{ m}^2$$

Question:33

There is a rectangular field of size 94 m × 32 m. Three roads each of 2 m width pass through the field such that two roads are parallel to the breadth of the field and the third is parallel to the length. Calculate: i area of the field covered by the three roads ii area of the field not covered by the roads.

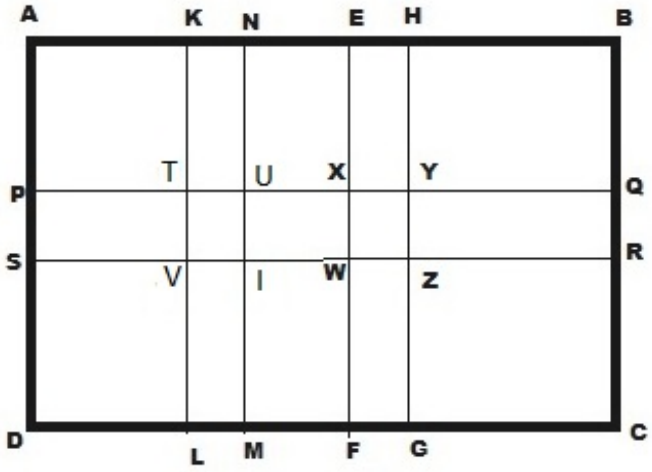
Solution:

Let *ABCD* be the rectangular field.

Here,

Two roads which are parallel to the breadth of the field *KLMN* and *EFGH* with width 2 m each.

One road which is parallel to the length of the field *PQRS* with width 2 m.



Length of the rectangular field *AB* = 94 m and breadth of the rectangular field *BC* = 32 m

∴ Area of the rectangular field = Length x Breadth = 94 m x 32 m = 3008 m^2

Area of the road *KLMN* = 32 m x 2 m = 64 m^2

Area of the road *EFGH* = 32 m x 2 m = 64 m^2

Area of the road *PQRS* = 94 m x 2 m = 188 m^2

Clearly area of *TUVI* and *WXYZ* is common to these three roads.

Thus,

Area of *TUVI* = 2 m x 2 m = 4 m^2

Area of *WXYZ* = 2 m x 2 m = 4 m^2

Hence,

i Area of the field covered by the three roads:

= Area (*KLMN*) + Area (*EFGH)* + Area (*PQRS*) – {Area (*TUVI*) + Area (*WXYZ*)}

= [64+ 64 + 188 – (4 + 4)] m^2

= 316 m^2 – 8 m^2

= 308 m^2

ii Area of the field not covered by the roads:

= Area of the rectangular field *ABCD* – Area of the field covered by the three roads

= 3008 m^2 – 308 m^2

= 2700 m^2

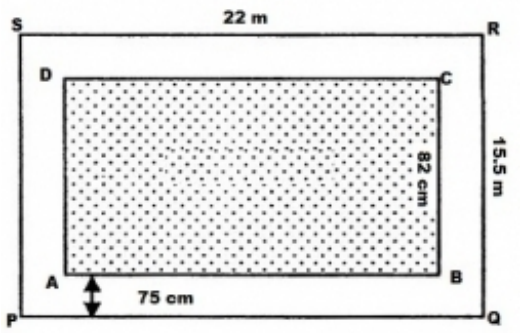
Question:34

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 uncoverd. If the width of the carpet is 82 cm, find the cost at the rate of Rs 18 per metre.

Solution:

We have,

Length of the hall *PQ* = 22 m and breadth of the hall *QR* = 15.5 m



∴ Area of the school hall *PQRS* = 22 m x 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 x 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

Again,

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

Thus,

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

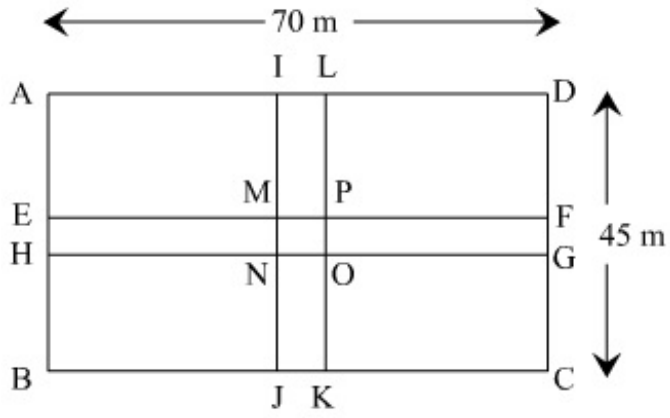
Cost of the 350 m long carpet = Rs. 18 x 350 = Rs. 6300

Question:35

Two cross roads, each of width 5 m, run at right angles through the centre of a rectangular park of length 70 m and breadth 45 m parallel to its sides. Find the area of the roads. Also, find the cost of constructing the roads at the rate of Rs 105 per m^2.

Solution:

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



Length of the rectangular park *AD* = 70 cm

Breadth of the rectangular park *CD* = 45 m

∴ Area of the rectangular park = Length x Breadth = 70 m x 45 m = 3150 m^2

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

Area of the road *JKIL* = 45 m x 5 m = 225 m^2

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

Thus, Area of *MNOP* = 5 m x 5 m = 25 m^2

Hence,

Area of the roads = Area (*EFGH*) + Area (*JKIL*) – Area (*MNOP*)

$= 350 + 225$ m^2 – 25 m^2 = 550 m^2

Again, it is given that the cost of constructing the roads = Rs. 105 per m^2

Therefore,

Cost of constructing 550 m^2 area of the roads = Rs. 105×550

= Rs. 57750.

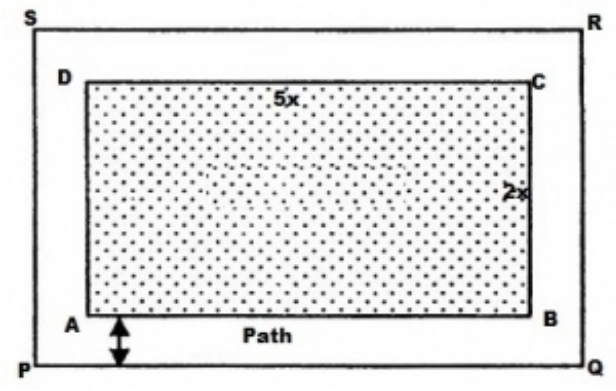
Question:36

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 the park has an area 305 m^2. Find the dimensiions of the park.

Solution:

We have,

Area of the path = 305 m^2



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

Thus,

Area of the rectangular park = $5x \times 2x = 10x^2$ m^2

Width of the path = 2.5 m

Outer length $PQ = 5x$ m $+ 2.5$ m $+ 2.5$ m $= (5x + 5)$ m

Outer breadth $QR = 2x + 2.5$ m $+ 2.5$ m $= (2x + 5)$ m

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

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

$\Rightarrow 305 = 35x + 25$

$\Rightarrow 305 - 25 = 35x$

$\Rightarrow 280 = 35x$

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

Therefore,

Length of the park $= 5x = 5 \times 8 = 40$ m

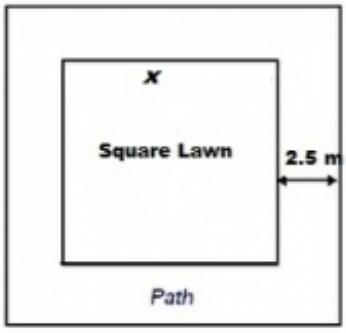
Breadth of the park $= 2x = 2 \times 8 = 16$ m

Question:37

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 the side of the lawn be x m.



Given that width of the path = 2.5 m

Side of the lawn including the path $= (x + 2.5 + 2.5)$ m $= (x + 5)$ m

So, area of lawn $= Area of the lawn including the path - Area of the path$

We know that the area of a square $= Side^2$

$\therefore$ Area of lawn $(x^2) = (x + 5)^2 - 165$

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

$\Rightarrow 165 = 10x + 25$

$\Rightarrow 165 - 25 = 10x$

$\Rightarrow 140 = 10x$

Therefore $x = 140 \div 10 = 14$

Thus the side of the lawn = 14 m

Hence,

The area of the lawn = $14m^2$ = 196 m^2

Question:38

Find the area of a parallogram with base 8 cm and altitude 4.5 cm.

Solution:

We have,

Base = 8 cm and altitude = 4.5 cm

Thus,

Area of the parallelogram = Base x Altitude

= 8 cm x 4.5 cm

= 36 cm^2

Question:39

Find the area in square metres of the parallelogram whose base and altitudes are as under:

i Base = 15 dm, altitude = 6.4 dm

ii Base = 1 m 40 cm, altitude = 60 cm

Solution:

We have,

i Base = 15 dm = $15x10$cm = 150 cm = 1.5 m

$$Since 100cm = 1m$$

Altitude = 6.4 dm = $6.4x10$cm = 64 cm = 0.64 m

Thus,

Area of the parallelogram = Base x Altitude

= 1.5 m x 0.64 m

= 0.96 m^2

ii Base = 1 m 40 cm = 1.4 m

$$Since 100cm = 1m$$

Altitude = 60 cm = 0.6 m

Thus,

Area of the parallelogram = Base x Altitude

= 1.4 m x 0.6 m

= 0.84 m^2

Question:40

Find the altitude of a parallelogram whose area is 54 dm^2 and base is 12 dm.

Solution:

We have,

Area of the given parallelogram = 54 dm^2

Base of the given parallelogram = 12 dm

∴ Altitude of the given parallelogram = $\frac{\text{Area}}{\text{Base}} = \frac{54}{12}\,\text{dm} = 4.5\ \text{dm}$

Question:41

The area of a rhombus is 28 m^2. If its perimeter be 28 m, find its altitude.

Solution:

We have,

Perimeter of a rhombus = 28 m

∴ $4Side$ = 28 m

$$Since perimeter = 4(Side)$$

⇒ Side = $\frac{28\ \text{m}}{4} = 7\ \text{m}$

Now,

Area of the rhombus = 28 m^2

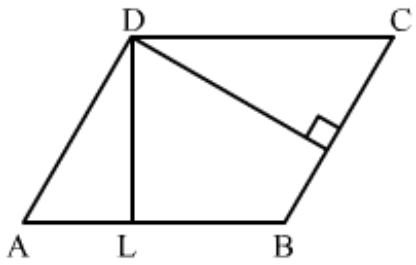
⇒ $Side x Altitude$ = 28 m^2

⇒ $7m x Altitude$ = 28 m^2

⇒ Altitude = $\frac{28\ \text{m}^2}{7\text{m}} = 4\ \text{m}$

Question:42

In Fig. 20, *ABCD* is a parallelogram, *DL* ⊥ *AB* and *DM* ⊥ *BC*. If AB = 18 cm, *BC* = 12 cm and *DM* = 9.3 cm, find *DL*.



Solution:

We have,

Taking *BC* as the base,

BC = 12 cm and altitude *DM* = 9.3 cm

∴ Area of parallelogram *ABCD* = Base x Altitude

$= 12cmx9.3cm$= 111.6 cm^2 i

Now,

Taking *AB* as the base, we have,

Area of the parallelogram *ABCD* = Base x Altitude = (18 cm x *DL*).....ii

From i and ii, we have

18 cm x *DL* = 111.6 cm^2

⇒ *DL* = $\frac{111.6\ \text{cm}^2}{18\ \text{cm}} = 6.2\ \text{cm}$

Question:43

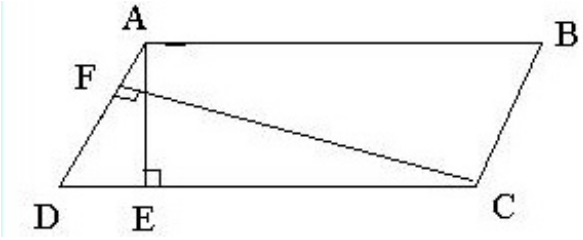
The longer side of a parallelogram is 54 cm and the corresponding altitude is 16 cm. If the altitude corresponding to the shorter side is 24 cm, find the length of the shorter side.

Solution:

We have,

ABCD is a parallelogram with the longer side *AB* = 54 cm and corresponding altitude *AE* = 16 cm.

The shorter side is *BC* and the corresponding altitude is *CF* = 24 cm.



Area of a parallelogram = base × height.We have two altitudes and two corresponding bases. So,

$\frac{1}{2} \times BC \times CF = \frac{1}{2} \times AB \times AE$

⇒ *BC* x *CF* = *AB* x *AE*

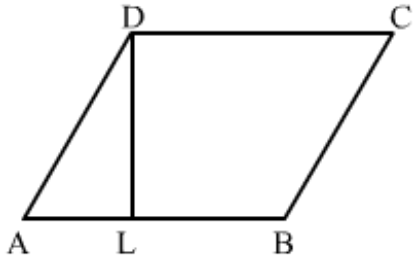
⇒ *BC* x 24 = 54 x 16

⇒ BC = $\frac{54\times16}{24} = 36\ \text{cm}$

Hence, the length of the shorter side *BC* = *AD* = 36 cm.

Question:44

In Fig. 21, *ABCD* is a parallelogram, *DL* ⊥ *AB*. If *AB* = 20 cm, *AD* = 13 cm and area of the parallelogram is 100 cm^2, find *AL*.



Solution:

We have,

ABCD is a parallelogram with base *AB* = 20 cm and corresponding altitude *DL.*

It is given that the area of the parallelogram *ABCD* = 100 cm^2

Now,

Area of a parallelogram = Base x Height

100 cm^2 = *AB* x *DL*

100 cm^2 = 20 cm x *DL*

$\therefore DL = \frac{100\ cm^2}{20\ cm} = 5\ cm$

Again by Pythagoras theorem, we have,

$(AD)^2 = (AL)^2 + (DL)^2$

$\Rightarrow 13^2 = (AL)^2 + 5^2$

$\Rightarrow (AL)^2 = 13^2 - 5^2$

$= 169 - 25 = 144$

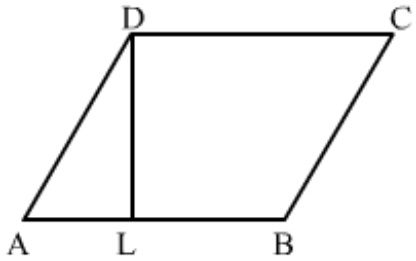
$\Rightarrow (AL)^2 = 12^2$

$\Rightarrow AL = 12$ cm

Hence. length of *AL* is 12 cm.

Question:45

In Fig. 21, if *AB* = 35 cm, *AD* = 20 cm and area of the parallelogram is 560 cm^2, find *LB*.



Solution:

We have,

ABCD is a parallelogram with base *AB* = 35 cm and corresponding altitude *DL*. The adjacent side of the parallelogram *AD* = 20 cm.

It is given that the area of the parallelogram *ABCD* = 560 cm^2

Now,

Area of the parallelogram = Base x Height

560 cm^2 = *AB* x *DL*

560 cm^2 = 35 cm x *DL*

$\therefore DL = \frac{560\ cm^2}{35\ cm} = 16\ cm$

Again by Pythagoras theorem, we have,

$(AD)^2 = (AL)^2 + (DL)^2$

$\Rightarrow 20^2 = (AL)^2 + 16^2$

$\Rightarrow (AL)^2 = 20^2 - 16^2$

$= 400 - 256 = 144$

$\Rightarrow (AL)^2 = 12^2$

$\Rightarrow AL = 12$ cm

From the figure,

AB = *AL* + *LB*

35 cm = 12 cm + *LB*

$\therefore$ *LB* = 35 cm – 12 cm

= 23 cm

Hence, length of *LB* is 23 cm.

Question:46

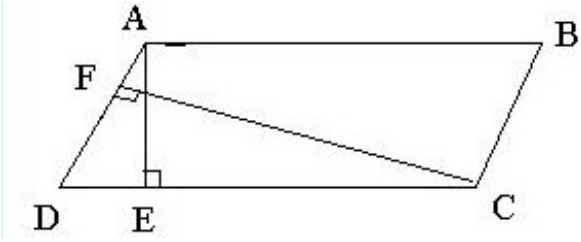
The adjacent sides of a parallelogram are 10 m and 8 m. If the distance between the longer sides is 4 m, find the distance between the shorter sides.

Solution:

We have,

ABCD is a parallelogram with side *AB* = 10 m and corresponding altitude *AE* = 4 m.

The adjacent side *AD* = 8 m and the corresponding altitude is *CF.*



Area of a parallelogram = Base × Height

We have two altitudes and two corresponding bases. So,

AD x *CF* = *AB* x *AE*

$\Rightarrow$ 8 m x *CF* = 10 m x 4 m

$\Rightarrow CF = \frac{10 \times 4}{8} = 5\ m$

Hence, the distance between the shorter sides is 5 m.

Question:47

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

Solution:

Let the height of the parallelogram be x cm.

Then the base of the parallelogram is $2x$ cm.

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

So,

Area of a parallelogram = Base x Height

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

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

$\Rightarrow x^2 = \frac{512\ cm^2}{2} = 256\ cm^2$

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

$\Rightarrow x = 16$ cm

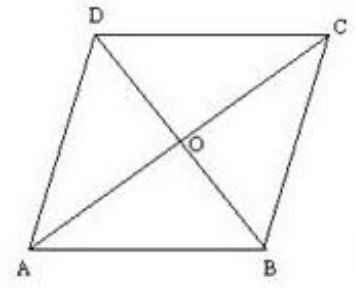
Hence, base = $2x = 2 \times 16 = 32$ cm and height = $x = 16$ cm.

Question:48

Find the area of a rhombus having each side equal to 15 cm and one of whose diagonals is 24 cm.

Solution:

Let $ABCD$ be the rhombus where diagonals intersect at O.



Then $AB = 15$ 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 such that

$OA = \frac{1}{2}AC = 12$ cm and $AB = 15$ cm.

By Pythagoras theorem, we have,

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

$\Rightarrow 15^2 = 12^2 + (OB)^2$

$\Rightarrow (OB)^2 = 15^2 - 12^2$

$\Rightarrow (OB)^2 = 225 - 144 = 81$

$\Rightarrow (OB)^2 = 9^2$

$\Rightarrow OB = 9$ cm

$\therefore BD = 2 \times OB = 2 \times 9$ cm $= 18$ cm

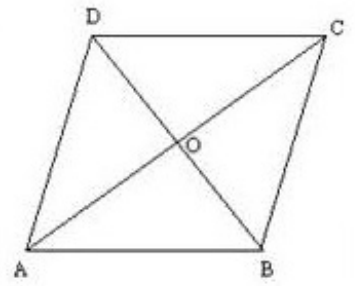
Hence,
Area of the rhombus *ABCD* = $\left(\frac{1}{2} \times AC \times BD\right) = \left(\frac{1}{2} \times 24 \times 18\right) = 216\ \text{cm}^2$

Question:49

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

Solution:

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



Then *AB* = 20 cm and *AC* = 24 cm.

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

Therefore Δ *AOB* is a right-angled triangle, right angled at *O* such that

OA = $\frac{1}{2} AC$ = 12 cm and *AB* = 20 cm

By Pythagoras theorem, we have,

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

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

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

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

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

$\Rightarrow OB = 16$ cm

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

Hence,

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

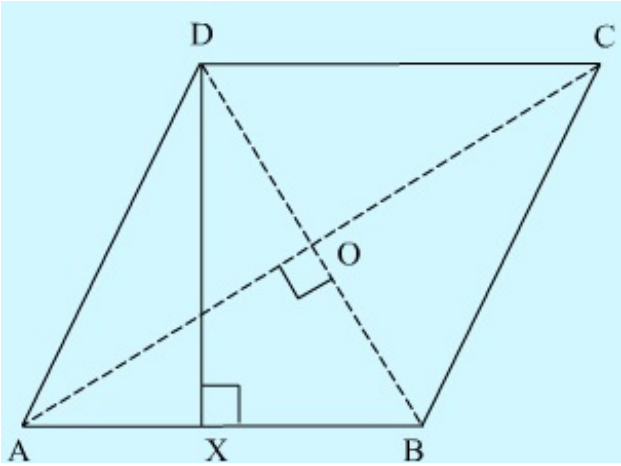
Question:50

The length of a side of a square field is 4 m. What will be the altitude of the rhombus, if the area of the rhombus is equal to the square field and one of its diagonals is 2 m?

Solution:

We have,

Side of a square = 4 m and one diagonal of a square = 2 m



Area of the rhombus = Area of the square of side 4 m

$\Rightarrow \left(\frac{1}{2} \times AC \times BD\right) = (4\ \mathrm{m})^2$

$\Rightarrow \left(\frac{1}{2} \times AC \times 2\ \mathrm{m}\right) = 16\ \mathrm{m}^2$

$\Rightarrow AC = 16\ \mathrm{m}$

We know that the diagonals of a rhombus are perpendicular bisectors of each other.

$\Rightarrow AO = \frac{1}{2} AC = 8\ \mathrm{m}$ and $BO = \frac{1}{2} BD = 1\ \mathrm{m}$

By Pythagoras theorem, we have:

$AO^2 + BO^2 = AB^2$

$\Rightarrow AB^2 = 8m^2 + 1m^2 = 64\ \mathrm{m}^2 + 1\ \mathrm{m}^2 = 65\ \mathrm{m}^2$

$\Rightarrow$ Side of a rhombus = $AB = \sqrt{65}$ m.

Let DX be the altitude.

Area of the rhombus = $AB \times DX$

$16\ \mathrm{m}^2 = \sqrt{65}\ \mathrm{m} \times DX$

$\therefore DX = \frac{16}{\sqrt{65}}\ \mathrm{m}$

Hence, the altitude of the rhombus will be $\frac{16}{\sqrt{65}}\ \mathrm{m}$.

Question:51

Two sides of a parallelogram are 20 cm and 25 cm. If the altitude corresponding to the sides of length 25 cm is 10 cm, find the altitude corresponding to the other pair of sides.

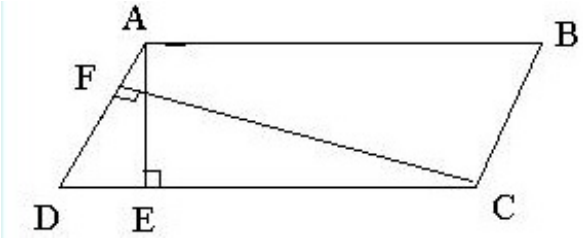
Solution:

We have,

$ABCD$ is a parallelogram with longer side AB = 25 cm and altitude AE = 10 cm.

As ABCD is a parallelogram .hence $AB=CD$ $opposite sides of parallelogram are equal$

The shorter side is AD = 20 cm and the corresponding altitude is CF.



Area of a parallelogram = Base × Height

We have two altitudes and two corresponding bases.

So,

⇒ *AD* x *CF* = *CD* x *AE*

⇒ 20 x *CF* = 25 x 10

$\therefore$ *CF* = $\frac{25\times10}{20} = 12.5 \text{ cm}$

Hence, the altitude corresponding to the other pair of the side *AD* is 12.5 cm.

Question:52

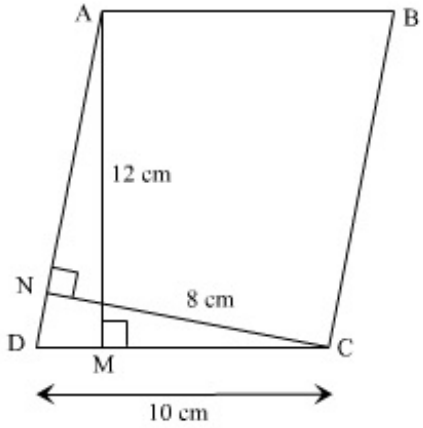
The base and corresponding altitude of a parallelogram are 10 cm and 12 cm respectively. If the other altitude is 8 cm, find the length of the other pair of parallel sides.

Solution:

We have,

ABCD is a parallelogram with side *AB* = *CD* = 10 cm $Opposite sides of parallelogram are equal$ and corresponding altitude *AM* = 12 cm.

The other side is *AD* and the corresponding altitude is *CN* = 8 cm



Area of a parallelogram = Base × Height

We have two altitudes and two corresponding bases.

So,

⇒ *AD* x *CN* = *CD* x *AM*

⇒ *AD* x 8 = 10 x 12

⇒ *AD* = $\frac{10\times12}{8} = 15 \text{ cm}$

Hence, the length of the other pair of the parallel side = 15 cm.

Question:53

A floral design on the floor of a building consists of 280 tiles. Each tile is in the shape of a parallelogram of altitude 3 cm and base 5 cm. Find the cost of polishing the design at the rate of 50 paise per cm^2.

Solution:

We have,

Altitude of a tile = 3 cm

Base of a tile = 5 cm

Area of one tile = Altitude x Base = 5 cm x 3 cm = 15 cm^2

Area of 280 tiles = 280 x 15 cm^2 = 4200 cm^2

Rate of polishing the tiles at 50 paise per cm^2 = Rs. 0.5 per cm^2

Thus,

Total cost of polishing the design = Rs. $4200x0.5$= Rs. 2100

Question:54

Find the area in square centimetres of a triangle whose base and altitude are as under:

i base = 18 cm, altitude = 3.5 cm

ii base = 8 dm, altitude = 15 cm

Solution:

We know that the area of a triangle = $\frac{1}{2} \times \text{Base} \times \text{Height}$

i Here, base = 18 cm and height = 3.5 cm

$\therefore$ Area of the triangle = $\left(\frac{1}{2} \times 18 \times 3.5\right) = 31.5 \text{ cm}^2$

ii Here, base = 8 dm = $8x10$cm = 80 cm

$$Since 1dm = 10cm$$

and height = 3.5 cm

$\therefore$ Area of the triangle = $\left(\frac{1}{2} \times 80 \times 15\right) = 600 \text{ cm}^2$

Question:55

Find the altitude of a triangle whose area is 42 cm^2 and base is 12 cm.

Solution:

We have,

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

Here, base = 12 cm and area = 42 cm^2

$\therefore$ Altitude = $\frac{2\times 42}{12} = 7 \text{ cm}$

Question:56

The area of a triangle is 50 cm^2. If the altitude is 8 cm, what is its base?

Solution:

We have,

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

Here, altitude = 8 cm and area = 50 cm^2

$\therefore$ Altitude =$\frac{2\times 50}{8} = 12.5 \text{ cm}$

Question:57

Find the area of a right angled triangle whose sides containing the right angle are of lengths 20.8 m and 14.7 m.

Solution:

In a right-angled triangle, the sides containing the right angles are of lengths 20.8 m and 14.7 m.

Let the base be 20.8 m and the height be 14.7 m.

Then,

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

$= \frac{1}{2} \times 20.8 \times 14.7 = 152.88 \text{ m}^2$

Question:58

The area of a triangle, whose base and the corresponding altitude are 15 cm and 7 cm, is equal to area of a right triangle whose one of the sides containing the right angle is 10.5 cm. Find the other side of this triangle.

Solution:

For the first triangle, we have,

Base = 15 cm and altitude = 7 cm

Thus, area of a triangle = $\frac{1}{2} \times \text{Base} \times \text{Altitude}$

$= \frac{1}{2} \times 15 \times 7 = 52.5 \text{ cm}^2$

It is given that the area of the first triangle and the second triangle are equal.

Area of the second triangle = 52.5 cm^2

One side of the second triangle = 10.5 cm

Therefore,

The other side of the second triangle = $\frac{2\times \text{Area}}{\text{One side of a triangle}}$

$$= \frac{2\times 52.5}{10.5} = 10 \text{ cm}$$

Hence, the other side of the second triangle will be 10 cm.

Question:59

A rectangular field is 48 m long and 20 m wide. How many right triangular flower beds, whose sides containing the right angle measure 12 m and 5 m can be laid in this field?

Solution:

We have,

Length of the rectangular field = 48 m

Breadth of the rectangular field = 20 m

Area of the rectangular field = Length x Breadth = 48 m x 20 m = 960 m^2

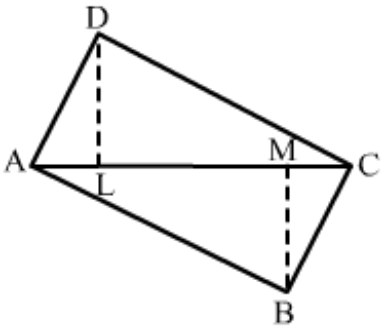
Area of one right triangular flower bed = $\frac{1}{2} \times 12 \text{ m} \times 5 \text{ m} = 30 \text{ m}^2$

Therefore,

Required number of right triangular flower beds = $\frac{960 \text{ m}^2}{30 \text{ m}^2} = 32$

Question:60

In Fig. 29, *ABCD* is a quadrilateral in which diagonal *AC* = 84 cm; *DL* ⊥ *AC*, *BM* ⊥ *AC*, *DL* = 16.5 cm and *BM* = 12 cm. Find the area of quadrilateral *ABCD*.



Solution:

We have,

AC = 84 cm, *DL* = 16.5 cm and *BM* = 12 cm

Area of Δ *ADC* = $\frac{1}{2}$x *AC* x *DL*

= $\frac{1}{2}$x 84 cm x 16.5 cm = 693 cm^2

Area of Δ *ABC* = $\frac{1}{2}$x *AC* x *BM*

= $\frac{1}{2}$x 84 cm x 12 cm = 504 cm^2

Hence,

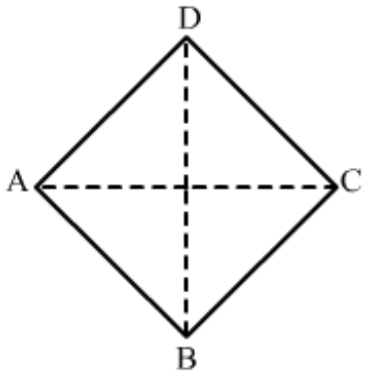
Area of quadrilateral *ABCD* = Area of Δ *ADC* + Area of Δ *ABC*

$= 693 + 504 \text{cm}^2$

$= 1197 \text{ cm}^2$

Question:61

Find the area of the quadrilateral ABCD given in Fig. 30. The diagonals *AC* and BD measure 48 m and 32 m respectively and are perpendicular to each other.



Solution:

We have,

Diagonal *AC* = 48 cm and diagonal *BD* = 32 m

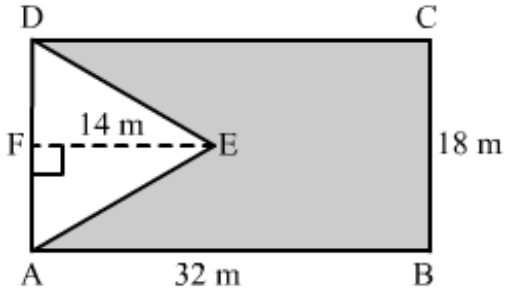
∴ Area of a quadrilateral = $\frac{1}{2}$x Product of diagonals

= $\frac{1}{2}$x *AC* x *BD*

= ($\frac{1}{2}$ x 48 x 32) $\text{m}^2 = 24x32 \text{m}^2$ = 768 m^2

Question:62

In Fig 31, *ABCD* is a rectangle with dimensions 32 m by 18 m. *ADE* is a triangle such that *EF* ⊥ *AD* and *EF* = 14 cm. Calculate the area of the shaded region.



Solution:

We have,

Area of the rectangle = *AB* x *BC*

= 32 m x 18 m

= 576 m^2

Area of the triangle $= \frac{1}{2}$x *AD* x *FE*

$= \frac{1}{2}$x BC x FE

$$Since AD = BC$$

$= \frac{1}{2}$x 18 m x 14 m

= 9 m x 14 m = 126 m^2

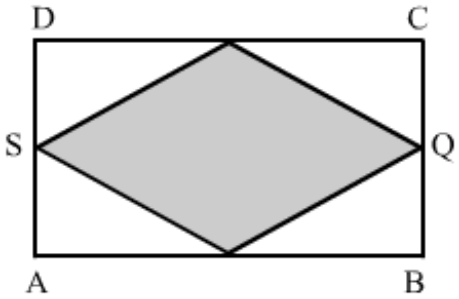
∴ Area of the shaded region = Area of the rectangle – Area of the triangle

$= 576 - 126 m^2$

= 450 m^2

Question:63

In Fig. 32, *ABCD* is a rectangle of length *AB* = 40 cm and breadth *BC* = 25 cm. If *P*, *Q*, *R*, *S* be the mid-points of the sides *AB*, *BC*, *CD* and *DA* respectively, find the area of the shaded region.

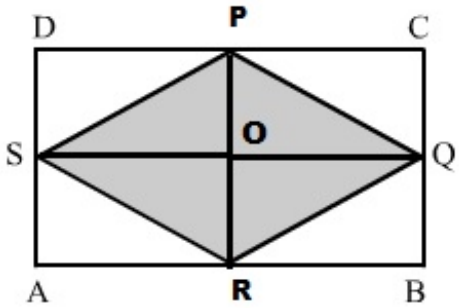


Solution:

We have,

Join points *PR* and *SQ*.

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



Here, *AB* = *DC* = *SQ* = 40 cm and *AD* = *BC* =*RP* = 25 cm

Also *OP* = *OR* = $\frac{RP}{2} = \frac{25}{2} = 12.5$ cm

From the figure we observed that,

Area of Δ *SPQ* = Area of Δ *SRQ*

Hence, area of the shaded region = 2 x (Area of Δ *SPQ*)

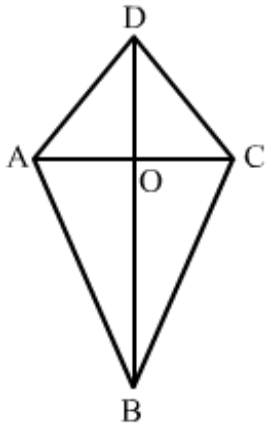
= 2 x ($\frac{1}{2}$ x *SQ* x *OP)*

$= 2 \times (\frac{1}{2} \times 40 \text{ cm} \times 12.5 \text{ cm})$

$= 500 \text{ cm}^2$

Question:64

Calculate the area of the quadrilateral *ABCD* as shown in Fig. 33, given that *BD* = 42 cm, *AC* = 28 cm, *OD* = 12 cm and *AC* ⊥ *BD*.



Solution:

We have,

BD = 42 cm, *AC* = 28 cm, *OD* = 12 cm

Area of Δ*ABC* = x *AC* x *OB*

= x *AC* x (*BD* – *OD*)

= x 28 cm x 42 cm – 12 cm = x 28 cm x 30 cm = 14 cm x 30 cm = 420 cm^2

Area of Δ *ADC* = x *AC* x *OD*

= x 28 cm x 12 cm = 14 cm x 12 cm = 168 cm^2

Hence,

Area of the quadrilateral *ABCD* = Area of Δ *ABC* + Area of Δ *ADC*

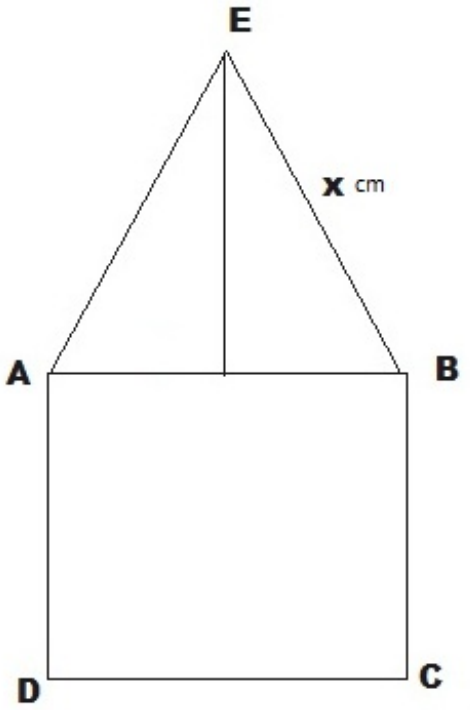
= 420 + 168 cm^2 = 588 cm^2

Question:65

Find the area of a figure formed by a square of side 8 cm and an isosceles triangle with base as one side of the square and perimeter as 18 cm.

Solution:

Let *x* cm be one of the equal sides of an isosceles triangle.



Given that the perimeter of the isosceles triangle = 18 cm

Then,

$x + x + 8 = 18$

$\Rightarrow 2x = 18 - 8$ cm $= 10$ cm

$\Rightarrow x = 5$ cm

Area of the figure formed = Area of the square + Area of the isosceles triangle

$= \text{Side of square}^2 +$

$= 8^2 +$

$=$

$=$

$=$

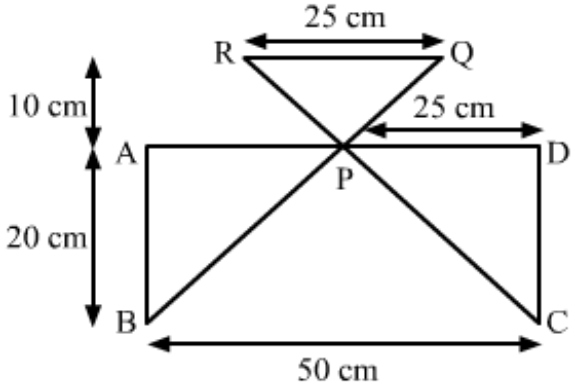
$= 64 + 12 = 76 \text{ cm}^2$

Question:66

Find the area of Fig. 34 in the following ways:

i Sum of the areas of three triangles

ii Area of a rectangle – sum of the areas of five triangles



Solution:

We have,

i P is the midpoint of AD.

Thus $AP = PD = 25$ cm and $AB = CD = 20$ cm

From the figure, we observed that,

Area of ΔAPB = Area of ΔPDC

Area of Δ APB = x AB x AP

= x 20 cm x 25 cm = 250 cm^2

Area of ΔPDC = Area of ΔAPB = 250 cm^2

Area of ΔRPQ = x Base x Height

= x 25 cm x 10 cm = 125 cm^2

Hence,

Sum of the three triangles = 250 + 250 + 125 cm^2

= 625 cm^2

ii Area of the rectangle $ABCD$ = 50 cm x 20 cm = 1000 cm^2

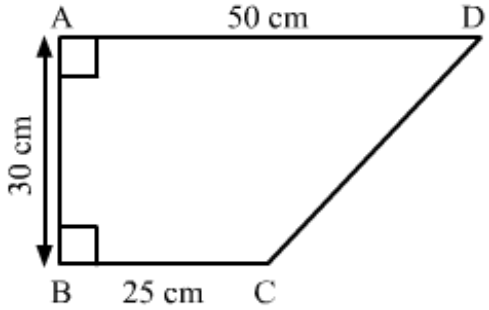
Thus,

Area of the rectangle – Sum of the areas of three triangles There is a mistake in the question; it should be area of three triangles

= 1000 – 625 cm^2 = 375 cm^2

Question:67

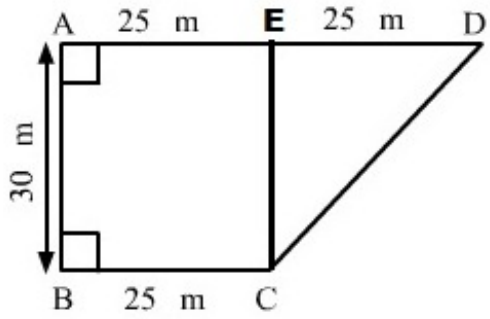
Calculate the area of quadrilateral field $ABCD$ as shown in Fig. 35, by dividing it into a rectangle and a triangle.



Solution:

We have,

Join *CE*, which intersect *AD* at point *E.*



Here, $AE = ED = BC = 25$ m and $EC = AB = 30$ m

Area of the rectangle $ABCE = AB \times BC$

$= 30 \text{ m} \times 25 \text{ m}$

$= 750 \text{ m}^2$

Area of $\Delta CED = \times EC \times ED$

$= \times 30 \text{ m} \times 25 \text{ m}$

$= 375 \text{ m}^2$

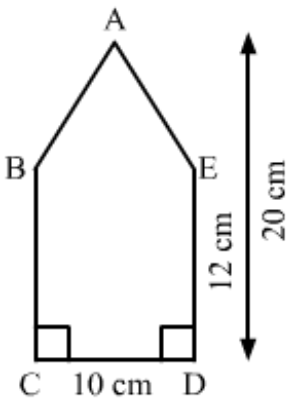
Hence,

Area of the quadrilateral $ABCD = 750 + 375 \text{ m}^2$

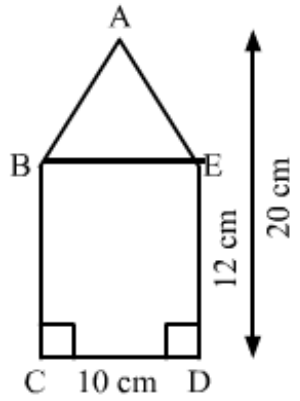
$= 1125 \text{ m}^2$

Question:68

Calculate the area of the pentagon *ABCDE*, where $AB = AE$ and with dimensions as shown in Fig. 36.



Solution:



Join *BE*.

Area of the rectangle *BCDE* = *CD* x *DE*

= 10 cm x 12 cm = 120 cm^2

Area of Δ*ABE* = x *BE* x height of the triangle

= x 10 cm x 20 – 12 cm

= x 10 cm x 8 cm = 40 cm^2

Hence,

Area of the pentagon *ABCDE* = 120 + 40 cm^2 = 160 cm^2

Question:69

The base of a triangular field is three times its altitude. If the cost of cultivating the field at Rs 24.60 per hectare is Rs 332. 10, find its base and height.

Solution:

Let altitude of the triangular field be *h* m

Then base of the triangular field is *3h* m.

Area of the triangular field = ...i

The rate of cultivating the field is Rs 24.60 per hectare.

Therefore,

Area of the triangular field =

= 135000 m^2 [Since 1 hectare = 10000 m^2].....ii

From equation i and ii we have,

$3h^2$ = 135000 x 2 = 270000 m^2

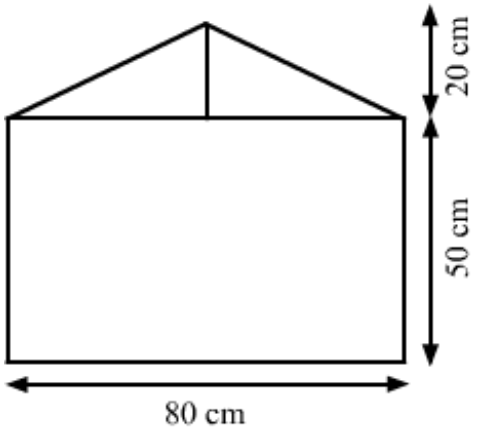
h^2 = ^{2}=90000 m2 = 300 m^2

⇒ *h* = 300 m

Hence,
Height of the triangular field = 300 m and base of the triangular field = 3 x 300 m = 900 m

Question:70

A wall is 4.5 m long and 3 m high. It has two equal windows, each having form and dimensions as shown in Fig. 37. Find the cost of painting the wall leaving windows at the rate of Rs 15 per m_2.



Solution:

We have,
Length of a wall = 4.5 m
Breadth of the wall =3 m
Area of the wall = Length x Breadth = 4.5 m x 3 m = 13.5 m^2
From the figure we observed that,
Area of the window = Area of the rectangle + Area of the triangle
= 0.8 m x 0.5 m + (x 0.8 m x 0.2 m) Since 1 m = 100 cm
= 0.4 m^2 + 0.08 m^2 = 0.48 m^2
Area of two windows = 2 x 0.48 = 0.96 m^2
Area of the remaining wall leaving windows = 13.5 – 0.96 m^2 = 12.54 m^2
Cost of painting the wall per m^2 = Rs. 15
Hence, the cost of painting on the wall = Rs. 15 x 12.54 = Rs. 188.1
In the book, the answer is given for one window, but we have 2 windows.

Question:71

If the area of a square is 225 m^2, then its perimeter is

a 15 m b 60 m c 225 m d 30 m

Solution:

Let *a* be the side of the square. Then

Area of square = a^2

225 = a^2

$a^2 = 15^2$

a = 15 m

Perimeter of the square = 4a = 4 15 = 60 m

Hence, the correct option is b.

Question:72

If the perimeter of a square is 16 cm, then its area is

a 4 cm^2 b 8 cm^2 c 16 cm^2 d 12 cm^2

Solution:

Let a be the side of the square. Then

Perimeter = 4a

16 = 4a

a = 4 cm

Area of the square = $a^2 = 4^2$ = 16 cm^2

Hence, the correct option is c.

Question:73

The length of a rectangle is 8 cm and its area is 48 cm^2. The perimeter of the rectangle is

a 14 cm b 24 cm c 12 cm d 28 cm

Solution:

Let a and b be the length and breadth of the rectangle respectively. Then

Area of the rectangle = ab

48 = a 8 ($\because$ b = 8 cm)

a = 6 cm

Perimeter of the rectangle = 2(a + b) = 2 6 + 8 = 28 cm

Hence, the correct option is d.

Question:74

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

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

Solution:

Let a be the side of the square. Then

Area of the square = a^2

Area of the square drawn on the diagona =

Required ratio = $a^2 : 2a^2 = 1 : 2$

Hence, the correct option is b.

Question:75

The length of the diagonal of a square is d. the area of the square is

a d^2 b c d $2d^2$

Solution:

Let a be the side of the square. Then

Diagonal of the square =

Therefore

Hence, the correct option is b.

Question:76

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:

Let d be the diagonal of the second square. Then, the diagonal of the first square will be $2d$.

∵

∴

Hence, the correct option is d.

Question:77

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:

Let a and b be the sides of the squares, then as per the question

Therefore

Thus, the of the required ratio is 3 : 1.
Hence, the correct option is b.

Question:78
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 2 : c 4 : 3 d 4 :
Solution:
Area of the square = a^2
Area of the equilateral triangle =

Thus, the required ratio is 4 : .
Hence, the correct option is d.

Question:79
On increasing each side of a square by 25%, the increase in area will be

a 25% b 55% c 55.5% d 56.25%
Solution:
Let *a* be the side of the square. Then
Side of the new square = *a* + 25% of *a* =
Old area = a^2
New area =
% increase in the area =
Hence, the correct option is d.

Question:80
The area of a square is 50 cm^2. The length of its diagonal is

a 5 cm b 10 cm c 10 cm d 8 cm
Solution:
Let *a* be the side of the square. Then
Area of the square = a^2 = 50 cm^2
Now
Diagonal of the square =
Hence,the correct option is b.

Question:81

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

a 196 cm^2 b 88 cm^2 c 98 cm^2 d 148 cm^2

Solution:

Let *a* be the side of the square. Then

Diagonal of the square =

Now

Area of the square =

Hence,the correct option is c.

Question:82

The area of a square filed is 64 m^2. A path of uniform width is laid around and outside of it. If the area of the path is 17 m^2, then the width of the path is

a 1 m b 1.5 m c 0.5 m d 2 m

Solution:

Let *a* be the side of inner square. Then

Let *x* be the width of the path, then

Side of outer square = $(a + x)$ cm = $(8 + x)$ cm

Now

Area of path = Area of outer square – Area of inner square

$17 = (8 + x)^2 - 64$

Thus, the width of the path is 1 m.

Hence, the correct option is a.

Question:83

A path of 1 m runs around and inside a square garden of side of 20 m. The cost of levelling the path at the rate of 2.25 per square metre is

a 154 b 164 c 182 d 171

Solution:

Width of the path = 1 m
Side of the square garden = 20 m
Side of the inner square = 20 – 2 m = 18 m
∴ Area of the path = Area of square garden – Area of inner square

Cost of levelling = 2.25 76 = 171
Thus, the required cost is 171.

Question:84

The length of and breadth of a rectangle are $(3x + 4)$ cm and $(4x – 13)$ cm. If the perimeter of the rectangle is 94 cm, then x =

a 4 b 8 c 12 d 6

Solution:

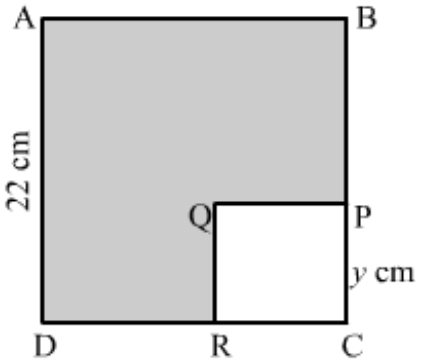
Here, $l = (3x + 4)$ cm and $b = (4x – 13)$ cm.
Perimeter of rectangle = $2(l + b)$
$= 2[(3x + 4) + (4x – 13)]$
$= 2(7x – 9) = 14x – 18$
Now, as per the question
Perimeter of rectangle = 94 cm

Hence, the correct option is b.

Question:85

In Fig. 38, $ABCD$ and $PQRC$ are squares such that $AD = 22$ cm and $PC = y$ cm. If the area of the shaded region is 403 cm^2,
then the value of y is

a 3 b 6 c 9 d 10



Solution:

Here, $AD = 22$ cm.

Area of square $ABCD = 22^2$ cm^2 = 484 cm^2

Area of square $PQRC = y^2$ cm^2

Now, as per the question

Area of shaded region = Area of square ABCD – Area of square $PQRC$

Hence, the correct option is c.

Question:86

The length and breadth of a rectangle are $(3x + 4)$ cm and $(4x – 13)$ cm respectively. If the perimeter of the rectangle is 94 cm, then its area is

a 432 cm^2 b 512 cm^2 c 542 cm^2 d 532 cm^2

Solution:

Here, $l = (3x + 4)$ cm, $b = (4x – 13)$ cm and Perimeter of rectangle = 94 cm.

Perimeter of rectangle $= 2(l + b) = 2[(3x + 4) + (4x – 13)] = (14x – 18)$ cm

As per the question

$14x – 18 = 94$

Now

$l = 3\ 8 + 4 = 28$ cm

$b = 4\ 8 – 13 = 19$ cm

Area of rectangle $= l\ b = 28\ 19 = 532$ cm^2

Hence, the correct option is d.

Question:87

The length and breadth of a rectangle are in the ratio 3 : 2. If the area is 216 cm^2, then its perimeter is

a 60 cm b 30 cm c 40 cm d 120 cm

Solution:

Here, $l = 3x$ cm, $b = 2x$ cm and area of rectangle = 216 cm^2.

Area of rectangle $= l\ \ b = 3x\ 2x = 6x^2$ cm^2

As per the question

$216 = 6x^2$

Now

$l = 3x = 3\ 6 = 18$ cm

$b = 2x = 2\ 6 = 12$ cm

Perimeter of rectangle $= 2(l + b) = 218 + 12 = 60$ cm

Hence, the correct option is a.

Question:88

If the length of a diagonal of a rectangle of length 16 cm is 20 cm, then its area is

a 192 cm^2 b 320 cm^2 c 160 cm^2 d 156 cm^2

Solution:

Here, $l = 16$ cm, Length of diagonal = 20 cm. Let b be the breadth of the rectangle.
In the right-angled triangle formed with the adjacent sides and the diagonal, using Pythagoras theorem, we get

Area of rectangle = $l \ b = 16\ 12 = 192\ cm^2$
Hence, the correct option is a.

Question:89

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

a 7 cm b 14 cm c 49 cm d 28 cm

Solution:

Here, Length of rectangle = 144 cm, Area of square = 84 cm^2.
Let b be the breadth of the rectangle, then as per the question
Area of rectangle = Area of square

Thus, the breadth of the rectangle is 49 cm.
Hence, the correct option is c.

Question:90

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:

Let $l = 5x$ and $b = 3x$ be the length and breadth of the rectangular field. Here, perimeter = 480 m.
So, as per the question
Perimeter = 2 ($l + b$)

$l = 5\ 30 = 150$ m

$b = 3\ 30 = 90$ m

Now

Area of the rectangular filed = $l\ b = 150\ 90 = 13500$ m^2

Hence, the correct option is b.

Question:91

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

a 30 m b 120 m c 90 m d 80 m

Solution:

Let l and b be the length and breadth of the rectangular field, then $l = 3b$.

So, as per the question

Perimeter = $2\ (l + b)$

Hence, the correct option is c.

Question:92

If the diagonal of a rectangle is 17 cm 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 240 cm^2

Solution:

Let l and b be the length and breadth of the rectangle, where diagonal = 17 cm and perimeter = 46 cm.

So, as per the question

Perimeter = $2\ (l + b)$

$46 = 2\ (l + b)$

$l + b = 23$ ..... (i)

Now, in the triangle formed by the adjacent sides and one diagonal of the rectangle, using Pythagoras theorem, we have

$l^2 + b^2 = \text{diagonal}^2$

$l^2 + b^2 = 17^2$

$l^2 + (23 - l)^2 = 17^2$ [From (i)]

$l^2 + l^2 + 23^2 - 46l = 289$

$2l^2 + 529 - 46l = 289$

$2l^2 - 46l + 240 = 0$

$l^2 - 23l + 120 = 0$

$l^2 - 15l - 8l + 120 = 0$

$l(l - 15) - 8(l - 15) = 0$

$(l - 15)(l - 8) = 0$

$l = 15$ cm or $l = 8$ cm

If $l = 15$ cm, then from (i), $b = 23 - 15 = 8$ cm.

If $l = 8$ cm, then from (i), $b = 23 - 8 = 23$ cm.

Therefore

Area of the rectangle = $l\ b = 15\ 8 = 120$ cm2

Hence, the correct option is c.

Question:93

The length and breadth of a rectangular field are 4 m and 3 m respectively. The field is divided into two

parts by fencing diagonally. The cost of fencing at the rate of 10 per metre is

a 50 b 30 c 190 d 240

Solution:

Let l and b be the length and breadth of the rectangle respectively. Then

$l = 4$ m and $b = 3$ m

Now, in the triangle formed by the adjacent sides and one diagonal of the rectangle, using Pythagoras theorem, we have

$l^2 + b^2 =$ Diagonal^2

Diagonal$^2 = 4^2 + 3^2 = 16 + 9 = 25$

Diagonal = 5 m

Length of fencing = $2(l + b)$ + Length of diagonal

$= 24 + 3 + 5$

$= 14 + 5$

$= 19$ m

Cost of fencing = 10 19 = 190

Hence, the correct option is c.

Question:94

The area of a parallelogram is 100 cm^2. If the base is 25 cm, then the corresponding height is

a 4 cm b 6 cm c 10 cm d 5 cm

Solution:

Let $b = 25$ cm and h be the base and the corresponding height of the parallelogram. Then

Area of parallelogram = $b\,h$

$100 = 25\,h$

$h = 4$ cm

Hence, the correct option is a.

Question:95

The base of a parallelogram is twice of its height. If its area is 512 cm^2, then the length of base is

a 16 cm b 32 cm c 48 cm d 64 cm

Solution:

Let b and h be the base and height, then $b = 2h$.

Area of parallelogram = $b\,h$

$512 = 2h\,h$

$2h^2 = 512$

$h^2 = 256$

$h = 16$ cm

$b = 2\ 16 = 32$ cm

Hence, the correct option is b.

Question:96

The lengths of the diagonals of a rhombus are 36 cm and 22.5 cm. Its area is

a 8.10 cm^2 b 405 cm^2 c 202.5 cm^2 d 1620 cm^2

Solution:

Here, $d_1 = 36$ cm and $d2 = 22.5$ cm.

Area of parallelogram =

Hence, the correct option is b.

Question:97

The length of a diagonal of a rhombus is 16 cm. If its area is 96 cm^2, then the length of other diagonal is

a 6 cm b 8 cm c 12 cm d 18 cm

Solution:

Let d_1 and d_2 be the diagonals of the rhombus, where $d_1 = 16$ and area of rhombus = 96 cm^2.

Area of parallelogram =

Thus, the length of other diagonal is 12 cm.

Hence, the correct option is c.

Question:98

The length of the diagonals of a rhombus of a rhombus are 8 cm and 14 cm. The area of one of the 4 triangles formed by the diagonals is

a 12 cm^2 b 8 cm^2 c 16 cm^2 d 14 cm^2

Solution:

Let $d_1 = 8$ cm and $d_2 = 14$ cm.

Area of parallelogram =

Since, the diagonals of a rhombus divides it into 4 equal parts, so

Area of the required triangle =

Hence, the correct option is d.

Question:99

The length of a rectangle 8 cm more than the breadth. If the perimeter of the rectangle is 80 cm, then the length of the rectangle is

a 16 cm b 24 cm c 28 cm d 18 cm

Solution:

Let l and b be the length and breadth of the rectangle, then $l = b + 8$.

Perimeter of rectangle = $2(l + b)$

$= 2(l + l - 8)$

$= 4l - 16$

Hence, the correct option is b.

Question:100

The length of a rectangle 8 cm more than the breadth. If the perimeter of the rectangle is 80 cm, then the area of the rectangle is

a 192 cm^2 b 364 cm^2 c 384 cm^2 d 382 cm^2

Solution:

Let l and b be the length and breadth of the rectangle, then $l = b + 8$.

Perimeter of rectangle = $2(l + b)$

$= 2(l + l - 8)$

$= 4l - 16$

Area of rectangle =

Hence, the correct option is c.

Question:101

The area of a rectangle is 11.6 m^2. If its breadth is 46.4 cm, then the perimeter is

a 25.464 m b 50.928 m c 101.856 m d None of these

Solution:

Here, area of rectangle(A) = 11.6 m^2, breadth(b) = 46.4 cm = 0.464 m.

Let l be the length of the rectangle, then

Area of rectangle = $l\,b$

$= l\,0.464$

Area of rectangle = 11.6

Now

Perimeter = $2(l + b)$

Hence, the correct option is b.

Question:102

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

a 7.5 cm b 6.5 cm c 8.5 cm d 9.5 cm

Solution:

Let b the side of the rhombus and h be its height.

Perimeter of rhombus = 56 cm

Now

Area of rhombus = 119 cm^2

Hence, the correct option is c.

Question:103

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

a 16 cm^2 b 32 cm^2 c 24 cm^2 d 8 cm^2

Solution:

Hence, the correct option is a.

Question:104

The area of an equilateral triangle is 4 cm^2. The length of each of its side is

a 3 cm b 4 cm c 2 cm d cm

Solution:

Hence, the correct option is b.

Question:105

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

a 3 cm^2 b 2 cm^2 c 2 cm^2 d 6 cm^2

Solution:

Let *a* and *h* respectively be the side and height of the equilateral triangle.

Therefore

Hence, the correct option is b.

Question:106

If A is the area of an equilateral triangle of height h, then

a $A = h^2$ b $A = h$ c $A = h^2$ d $3A = h^2$

Solution:

Let a and h be the side and height of the equilateral triangle respectively. Then

Therefore

Hence, the correct option is c.

Question:107

If area of an equilateral triangle is 3 cm^2, then its height is

a 3 cm b cm c 6 cm d 2 cm

Solution:

Let a and h be respectively the side and height of the equilateral triangle. Then

Therefore

Hence, the correct option is a.

Question:108

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:

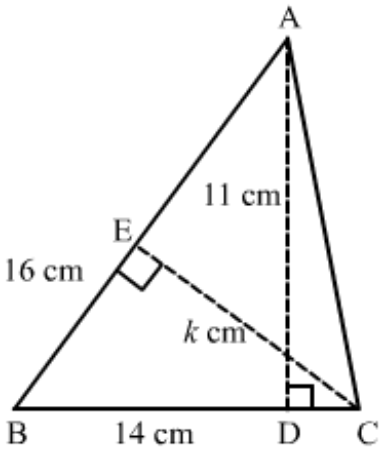
Let d_1 and d_2 be the diagonals of the rhombus, where $d_1 = 2d_2$.

Hence, the correct option is d.

Question:109

In fig. 38, the value of k is

a b c d



Solution:

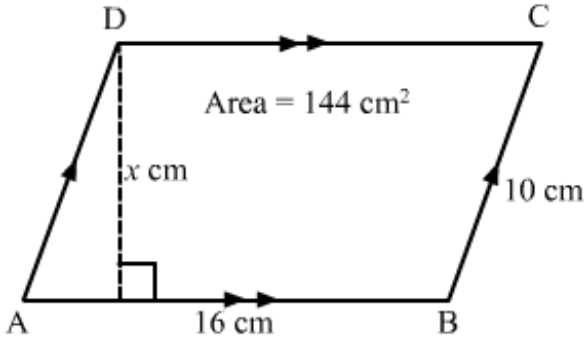
In triangle *ABC*, we have

Hence, the correct option is a.

Question:110

In fig. 40, *ABCD* is a parallelogram of area 144 cm^2, the value of *x* is

a 8 b 6 c 9 d 10



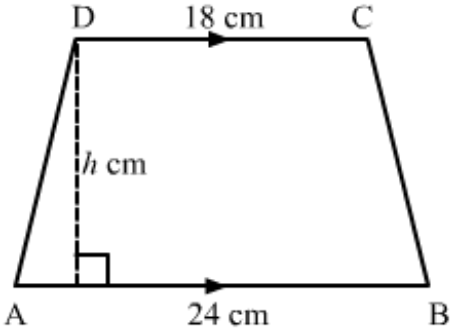
Solution:

Hence, the correct option is c.

Question:111

In fig. 41, if *ABCD* is a parallelogram of area 273 cm^2, the value of *h* is

a 13 b 12 c 8 d 14



Solution:

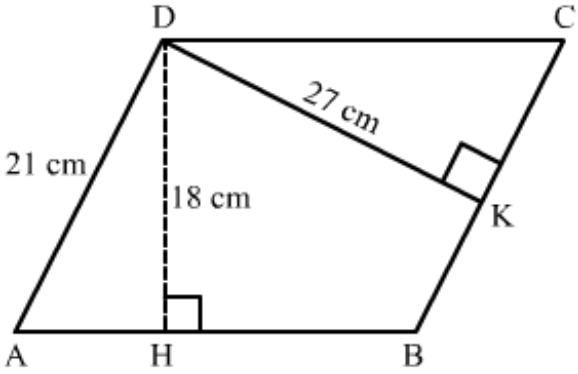
The quadrilateral *ABCD* is a trapezium whose area is 273 cm^2. So

Hence, the correct option is a.

Question:112

In Fig. 42, *ABCD* is a parallelogram in which *AD* = 21 cm, *DH* =18 cm and *DK* = 27 cm.
The length of *AB* is

a 63 cm b 63.5 cm c 31.5 cm d 31 cm



Solution:

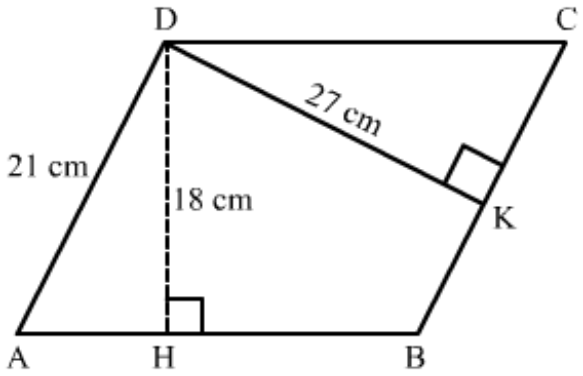
Area of a parallelogram = Base Height

Hence, the correct option is c.

Question:113

In Fig. 42, *ABCD* is a parallelogram in which *AD* = 21 cm, *DH* =18 cm and *DK* = 27 cm.
The perimeter of the parallelogram is

a 105 cm b 84.5 cm c 169 cm d 52.5 cm



Solution:

Area of a parallelogram = Base Height

Here, *ABCD* is a parallelogram, so *AB* = *CD* and *AD* = *BC*.

Therefore

Perimeter of parallelogram *ABCD* = 2(*AB* + *AD*)

= 231.5 + 21

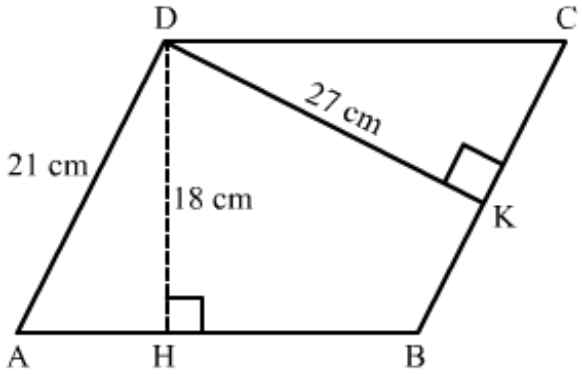
= 105 cm

Hence, the correct option is a.

Question:114

In Fig. 42, the area of the parallelogram is

a 516 cm^2 b 616 cm^2 c 416 cm^2 d 606 cm^2



Solution:

Here, *ABCD* is a parallelogram, so *AD* = *BC* = 21 cm.

Therefore

Area of parallelogram = Base Height

= *BC DK*

= 21 27

= 567 cm^2

Question:115

A piece of wire of length 12 cm is bent to form a square. The area of the square is

a $36\ cm^2$ b $144\ cm^2$ c $9\ cm^2$ d $12\ cm^2$

Solution:

Let a be the length of the side of the square. Then as per he question, we have

$4a = 12$

$a = 3$ cm

Therefore

Area of square $= a^2$

$= 3^2$

$= 9\ cm^2$

Thus, the area of the square is $9\ cm^2$.

Hence, the correct option is c

Question:116

The area of a right isosceles triangle whose hypotenuse is 16 cm is

a $125\ cm^2$ b $158\ cm^2$ c $128\ cm^2$ d $144\ cm^2$

Solution:

Let a be the length of the equal sides of the right isosceles triangle whose hypotenuse is 16 cm.

Then using Pythagoras theorem in the triangle, we get

$a^2 + a^2 = (16)^2$

$2a^2 = 512$

$a^2 = 256$

Therefore

Area of the triangle

Thus, the area of the square is $128\ cm^2$.

Hence, the correct option is c

Question:117

A wire is in the form of a square of side 18 m. It is bent in the form of a rectangle, whose length and breadth are in the ratio 3 : 1. The area of the rectangle is

a $81\ m^2$ b $243\ m^2$ c $144\ m^2$ d $324\ m^2$

Solution:

Side of square (a) = 18 m

Let $l = 3x$ and $b = x$ be the length and breadth of the rectangle. Then

Perimeter of rectangle = Perimeter of square

$$2(l + b) = 4a$$

$$2(3x + x) = 4\ 18$$

$$8x = 72$$

$$x = 9 \text{ m}$$

Thus

Length $(l) = 3x = 3\ 9 = 27$ m

Breadth $(b) = x = 9$ m

Therefore

Area of the rectangle $= l\ b$

$$= 27\ 9 = 243 \text{ m}^2$$

Thus, the area of the rectangle is 243 m^2.

Hence, the correct option is b