# Chapter : 17. PERIMETER AND AREA OF PLANE FIGURES

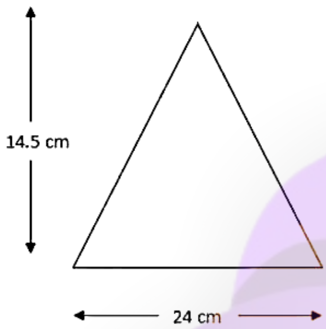
## Exercise : 17A

**Question: 1**

**Solution:**

Given: Base = 24 cm

Height = 14.5 cm




We know that,

Area of a triangle = 1/2 × Base × Height

= 1/2 × 24 cm × 14.5 cm

= 174 $cm^2$

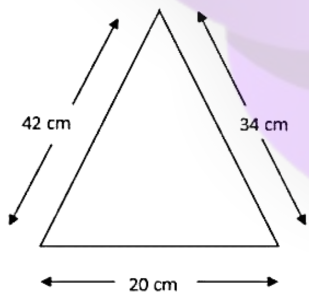
**Question: 2**

**Solution:**

Given: Side 1 = a (let) = 42 cm

Side 2 = b (let) = 34 cm

Side 3 = c (let) = 20 cm




We know that,

Area of a scalene triangle = √(s(s-a) (s-b) (s-c))

Where, $s = \frac{a+b+c}{2}$

$$s = \frac{42 + 34 + 20}{2} \text{cm}$$

$$\Rightarrow s = \frac{96}{2} \text{cm}$$

⇒ s = 48 cm

Now,

Area of a scalene triangle = √(48cm × (48-42)cm × (48-34)cm × (48-20)cm)

= √(48cm × 6cm × 14cm × 28cm)

= √112896 $cm^2$

= 336 $cm^2$

Clearly,

Length of longest side = 42 cm

Now,

We know that,

Area of a triangle = 1/2 × Base × Height

⇒ 336 $cm^2$ = 1/2 × 42 cm × Height

⇒ 336 $cm^2$ = 21 cm × Height

$$\Rightarrow \text{ Height } = \frac{336 \text{ cm}^2}{21 \text{ cm}}$$

⇒ Height = 16 cm

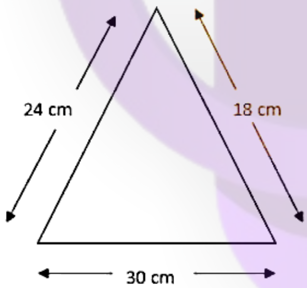
**Question: 3**

**Solution:**

Given: Side 1 = a (let) = 18 cm

Side 2 = b (let) = 24 cm

Side 3 = c (let) = 30 cm




We know that,

Area of a scalene triangle = √(s(s-a)(s-b)(s-c))

Where, $s = \frac{a+b+c}{2}$

$$s = \frac{18 + 24 + 30}{2} \text{ cm}$$

$$\Rightarrow s = \frac{72}{2} \text{ cm}$$

⇒ s = 36 cm

Now,

Area of a scalene triangle = √(36cm × (36-18)cm × (36-24)cm × (36-30)cm)

= √(36cm × 18cm × 12cm × 6cm)

$= \sqrt{46656}\ cm^2$

$= 216\ cm^2$

Clearly,

Length of smallest side = 18 cm

Now,

We know that,

Area of a triangle = 1/2 × Base × Height

$\Rightarrow 216\ cm^2 = 1/2 \times 18\ cm \times$ Height

$\Rightarrow 216\ cm^2 = 9\ cm \times$ Height

$$\Rightarrow \text{Height} = \frac{216\ \text{cm}^2}{9\ \text{cm}}$$

⇒ Height = 24 cm

**Question: 4**

**Solution:**

Given: Ratio of Sides = 5 : 12 : 13

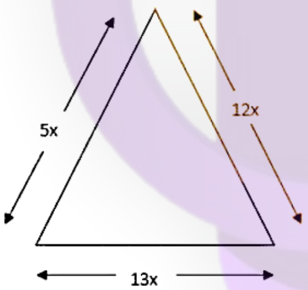
Perimeter = 150 cm

Let the sides be,

a = 5x cm

b = 12x cm

c = 13x cm




We know that,

Perimeter of a triangle = a + b + c

⇒ 150 cm = 5x cm + 12x cm + 13x cm

⇒ 150 cm = 30x cm

$$\Rightarrow x = \frac{150\ \text{cm}}{30\ \text{cm}}$$

⇒ x = 5

Therefore,

a = 5x cm = 5 × 5 cm = 25 cm

b = 12x cm = 12 × 5 cm = 60 cm

c = 13x cm = 13 × 5 cm = 65 cm

Now,

We know that,

Area of a scalene triangle = $\sqrt{(s(s-a)(s-b)(s-c))}$

Where, $s = \frac{a+b+c}{2}$

$s = \frac{25 + 60 + 65}{2}$ cm

$\Rightarrow s = \frac{150}{2}$ cm

$\Rightarrow s = 75$cm

Now,

Area of a scalene triangle = $\sqrt{(75\text{cm} \times (75-25)\text{cm} \times (75-60)\text{cm} \times (75-65)\text{cm})}$

$= \sqrt{(75\text{cm} \times 50\text{cm} \times 15\text{cm} \times 10\text{cm})}$

$= \sqrt{562500\ \text{cm}^2}$

$= 750\ \text{cm}^2$

**Question: 5**

**Solution:**

Given: Ratio of Sides = 25 : 17 : 12

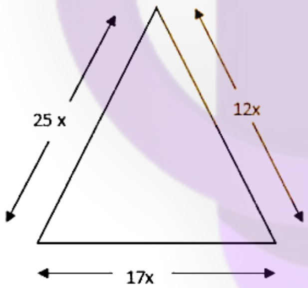
Perimeter = 540 m

Let the sides be,

a = 25x m

b = 17x m

c = 12x m




We know that,

Perimeter of a triangle = a + b + c

$\Rightarrow 540$ m = 25x m + 17x m + 12x m

$\Rightarrow 540$ m = 54x m

$\Rightarrow x = \frac{540\ \text{m}}{54\ \text{m}}$

$\Rightarrow x = 10$

Therefore,

a = 25x m = 25 × 10 m = 250 m

b = 17x m = 17 × 10 m = 170 m

c = 12x m = 12 × 10 m = 120 m

Now,

We know that,

Area of a scalene triangle = $\sqrt{(s(s-a)(s-b)(s-c))}$

Where, $s = \frac{a+b+c}{2}$

$s = \frac{250 + 170 + 120}{2}$ m

$\Rightarrow s = \frac{540}{2}$ m

$\Rightarrow$ s = 270 m

Now,

Area of a scalene triangle =

$\sqrt{(270m \times (270\text{-}250)m \times (270\text{-}170)m \times (270\text{-}120)m)} = \sqrt{(270m \times 20m \times 10m \times 150cm)}$

$= \sqrt{81000000}\ m^2$

$= 9000\ m^2$

Now,

The cost of ploughing 100 $m^2$ = Rs 40

Therefore, The cost of ploughing 1 $m^2$ = Rs $\frac{40}{100}$

Therefore, The cost of ploughing 9000 $m^2$ = Rs $\frac{40}{100} \times 9000$

= Rs 3600

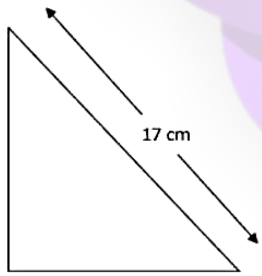
**Question: 6**

**Solution:**

Given: Perimeter = 40 cm

Hypotenuse = 17 cm

The diagram is given as:




Let the sides be a, b and c(hypotenuse).

Therefore, a + b + c = 40 cm

$\Rightarrow$ a + b + 17 = 40 cm

$\Rightarrow$ a + b = 40 - 17 cm

$\Rightarrow$ a + b = 23 cm

$\Rightarrow$ a = (23-b) cm

Now we know that,

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

$\Rightarrow a^2 + b^2 = c^2$

$\Rightarrow (23-b)^2 + b^2 = 17^2$

$\Rightarrow 23^2 + b^2 - 46b + b^2 = 289$

$\Rightarrow 529 + b^2 - 46b + b^2 = 289$

$\Rightarrow 2b^2 - 46b + 240 = 0$

$\Rightarrow b^2 - 23b + 120 = 0$

$\Rightarrow b^2 - 8b - 15b + 120 = 0$

$\Rightarrow b(b-8) - 15(b-8) = 0$

$\Rightarrow (b-8)(b-15) = 0$

This gives us two equations,

i. $b-8 = 0$

$\Rightarrow b = 8$

ii. $b-15 = 0$

$\Rightarrow b = 15$

Let b = 8 cm

$\Rightarrow a = (23-b)$ cm

$\Rightarrow a = (23-8)$ cm

$\Rightarrow a = 15$ cm

Now,

Area of triangle = 1/2 × base × height

= 1/2 × 8 × 15

= 60 $cm^2$

**Question: 7**

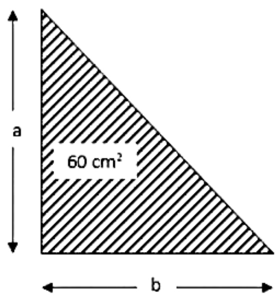
**Solution:**

Let the sides at right angles be a and b

And, the third side be c.

Given: a-b = 7 cm

Area of triangle = 60 $cm^2$




Now, since a-b = 7

$\Rightarrow a = b + 7$

Now we know that,

Area of triangle = 1/2 × base × height

$\Rightarrow 60 = 1/2 \times b \times (b + 7)$

$\Rightarrow 60 \times 2 = b^2 + 7b$

$\Rightarrow b^2 + 7b = 120$

$\Rightarrow b^2 + 7b - 120 = 0$

$\Rightarrow b^2 + 15b - 8b - 120 = 0$

$\Rightarrow b(b + 15) - 8(b + 15) = 0$

$\Rightarrow (b + 15)(b-8) = 0$

This gives us two equations,

i. $b - 8 = 0$

$\Rightarrow b = 8$

ii. $b + 15 = 0$

$\Rightarrow b = -15$

Since, the side of the triangle cannot be negative

Therefore, b = 8 cm

$\Rightarrow a = (b + 7)$ cm

$\Rightarrow a = (8 + 7)$ cm

$\Rightarrow a = 15$ cm

Now we know that,

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

$\Rightarrow a^2 + b^2 = c^2$

$\Rightarrow 15^2 + 8^2 = c^2$

$\Rightarrow c^2 = 225 + 64$

$\Rightarrow c^2 = 289$

$\Rightarrow c = 17$

Now,

Perimeter of triangle = a + b + c

$\Rightarrow$ Perimeter of triangle = 15 + 8 + 17

$\Rightarrow$ Perimeter of triangle = 40 cm

**Question: 8**

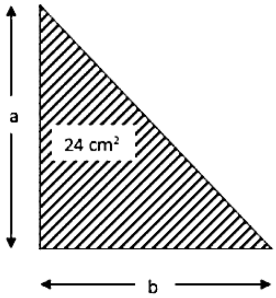
**Solution:**

Let the sides at right angles be a and b

And, the third side be c.

Given: a-b = 2 cm

Area of triangle = 24 $cm^2$




Now, since a-b = 2

⇒ a = b + 2

Now we know that,

Area of triangle = 1/2 × base × height

⇒ 24 = 1/2 × b × (b + 2)

⇒ 24 × 2 = $b^2$ + 2b

⇒ $b^2$ + 2b = 48

⇒ $b^2$ + 2b-48 = 0

⇒ $b^2$ + 8b-6b-48 = 0

⇒ b(b + 8)-6(b + 8) = 0

⇒ (b + 8)(b-6) = 0

This gives us two equations,

i. b + 8 = 0

⇒ b = -8

ii. b-6 = 0

⇒ b = 6

Since, the side of the triangle cannot be negative

Therefore, b = 6 cm

⇒ a = (b + 2) cm

⇒ a = (6 + 2) cm

⇒ a = 8 cm

Now we know that,

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

⇒ $a^2 + b^2 = c^2$

⇒ $8^2 + 6^2 = c^2$

⇒ $c^2$ = 64 + 36

⇒ $c^2$ = 100

⇒ c = 10

Now,

Perimeter of triangle = a + b + c

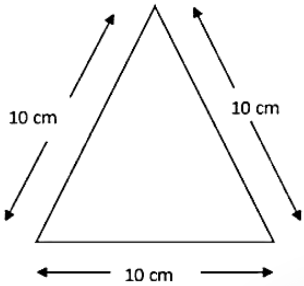
⇒ Perimeter of triangle = 8 + 6 + 10

⇒ Perimeter of triangle = 24 cm

**Question: 9**

**Solution:**

Given: Side of an equilateral triangle = 10 cm




(i) Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times \text{side}^2$

$= \frac{\sqrt{3}}{4} \times 10^2$

$= \frac{\sqrt{3}}{4} \times 100$

$= \frac{100\sqrt{3}}{4}$

$= 25\sqrt{3}$

$= 25 \times 1.732$

$= 43.3 \text{ cm}^2$

(ii) Height of equilateral triangle = $\frac{\sqrt{3}}{2} \times a$

$= \frac{\sqrt{3}}{2} \times 10$

$= \frac{10\sqrt{3}}{2}$

$= 5\sqrt{3}$

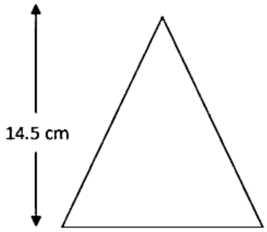
$= 5 \times 1.732$

$= 8.66 \text{ cm}^2$

**Question: 10**

**Solution:**

Given: Height of an equilateral triangle = 6 cm




Let sides of equilateral triangle be a cm

We know that,

Height of equilateral triangle = $\frac{\sqrt{3}}{2} \times a$

$\Rightarrow 6 = \frac{\sqrt{3}}{2} \times a$

$\Rightarrow 6 \times 2 = \sqrt{3} \times a$

$\Rightarrow 12 = a\sqrt{3}$

$\Rightarrow a = \frac{12}{\sqrt{3}}$

$\Rightarrow a = \frac{12}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$

$\Rightarrow a = \frac{12\sqrt{3}}{3}$

$\Rightarrow a = 4 \times 1.73$

$= 6.92\ cm^2$

Now,

Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times side^2$

$= \frac{\sqrt{3}}{4} \times 6.92^2$

$= \frac{\sqrt{3}}{4} \times 47.88$

$= 11.98\sqrt{3}\ cm^2$

$= 20.76\ cm^2$

**Question: 11**

**Solution:**

Given: Area of an equilateral triangle = $36\sqrt{3}\ cm^2$


We know that,

Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times \text{side}^2$

$\Rightarrow 36\sqrt{3} = \frac{\sqrt{3}}{4} \times \text{side}^2$

$\Rightarrow \text{side}^2 = 36\sqrt{3} \times \frac{4}{\sqrt{3}}$

$\Rightarrow \text{side}^2 = 36 \times 4$

$\Rightarrow$ side = 12 cm

Now,

Perimeter of equilateral triangle = 3 × side

= 3 × 12 cm

= 36 cm

**Question: 12**

**Solution:**

Given: Area of an equilateral triangle = $81\sqrt{3}$ cm²


We know that,

Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times \text{side}^2$

$\Rightarrow 81\sqrt{3} = \frac{\sqrt{3}}{4} \times \text{side}^2$

$\Rightarrow \text{side}^2 = 81\sqrt{3} \times \frac{4}{\sqrt{3}}$

$\Rightarrow \text{side}^2 = 81 \times 4$

$\Rightarrow$ side = 18 cm

Now,

Height of equilateral triangle = $\frac{\sqrt{3}}{2} \times \text{side}$

$= \frac{\sqrt{3}}{2} \times 18$

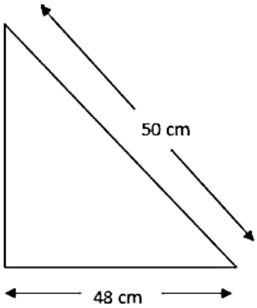
= $9\sqrt{3}$ cm

**Question: 13**

**Solution:**

Given: Base = 48 cm

Hypotenuse = 50 cm




We know that,

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

$\Rightarrow 48^2 + Perpendicular^2 = 50^2$

$\Rightarrow Perpendicular^2 = 50^2 - 48^2$

$\Rightarrow Perpendicular^2 = 2500 - 2304$

$\Rightarrow Perpendicular^2 = 196\ cm^2$

$\Rightarrow Perpendicular = 14\ cm$

Area of a triangle = 1/2 × Base × Height

= 1/2 × 48 cm × 14 cm

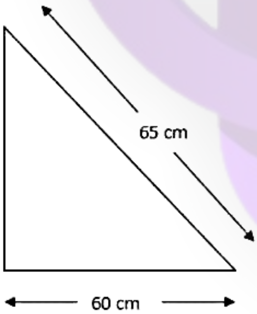
= 336 $cm^2$

**Question: 14**

**Solution:**

Given: Base = 60 cm

Hypotenuse = 65 cm




We know that,

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

$\Rightarrow 60^2 + Perpendicular^2 = 65^2$

$\Rightarrow Perpendicular^2 = 65^2 - 60^2$

$\Rightarrow Perpendicular^2 = 4225 - 3600$

$\Rightarrow Perpendicular^2 = 625\ cm^2$

$\Rightarrow Perpendicular = 25\ cm$

Area of a triangle = 1/2 × Base × Height

= 1/2 × 60 cm × 25 cm

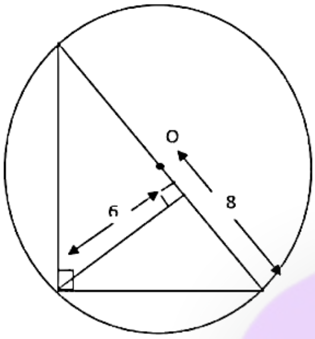
= 750 cm²

**Question: 15**

**Solution:**

Given: Radius of circle = 8 cm

Altitude = 6 cm




Since, in a right-angled triangle the hypotenuse

is the diameter of circumcircle.

Therefore,

Hypotenuse = 2 × Radius

= 2 × 8 cm

= 16 cm

Now, we consider the hypotenuse as base and the altitude to the hypotenuse as height

So,

Area of a triangle = 1/2 × Base × Height

= 1/2 × 16 cm × 6 cm

= 1/2 × 96 cm²

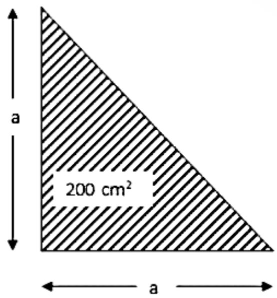
= 48 $cm^2$

**Question: 16**

**Solution:**

Given: Area = 200 cm

Let the equal sides be a.




We know that,

Area of a triangle = 1/2 × Base × Height

⇒ $200 = 1/2 \times a \times a$

⇒ $200 = 1/2 \times a^2$

⇒ $a^2 = 200 \times 2$

⇒ $a^2 = 400$

⇒ $a = 20$ cm

Now,

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

⇒ $20^2 + 20^2 = \text{Hypotenuse}^2$

⇒ $\text{Hypotenuse}^2 = 400 + 400$

⇒ $\text{Hypotenuse}^2 = 800\ \text{cm}^2$

⇒ Hypotenuse= $20\sqrt{2}$ cm

⇒ Hypotenuse= 28.2 cm

Now,

Perimeter of triangle = 20 + 20 + 28.2 cm

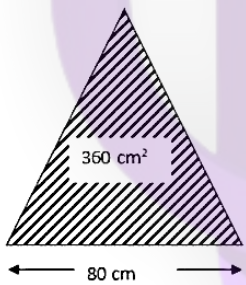
= 68.2 cm

**Question: 17**

**Solution:**

Given: Area of isosceles triangle = $360\ \text{cm}^2$

Base of triangle = 80 cm




Let a be the equal sides of the triangle

We know that,

Area of isosceles triangle = $1/4 \times b\sqrt{(4a^2 - b^2)}$

⇒ $360 = 1/4 \times 80\sqrt{(4a^2 - 80^2)}$

⇒ $360 = 1/4 \times 80\sqrt{(4a^2 - 6400)}$

⇒ $360 = 20\sqrt{[4(a^2 - 1600)]}$

⇒ $360 = 20 \times 2\sqrt{(a^2 - 1600)}$

⇒ $\frac{360}{20 \times 2} = \sqrt{a^2 - 1600}$

⇒ $9 = \sqrt{(a^2 - 1600)}$

On squaring both sides we get,

⇒ $81 = a^2 - 1600$

$\Rightarrow a^2 = 1600 + 81 = 1681$

$\Rightarrow a = 41$ cm

Now,

Perimeter of triangle = 41 cm + 41 cm + 80 cm

= 162 cm

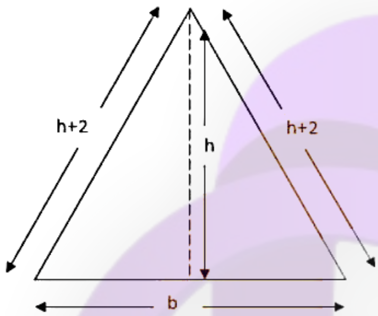
**Question: 18**

**Solution:**

Let height of triangle = h cm

Given: Base of the triangle (b) = 12 cm

Equal sides (a) = h + 2 cm




Now,

Area of a triangle = 1/2 × Base × Height

And,

Area of isosceles triangle = $1/4 \times b\sqrt{(4a^2 - b^2)}$

$\Rightarrow 1/2 \times \text{Base} \times \text{Height} = 1/4 \times b\sqrt{(4a^2 - b^2)}$

$\Rightarrow 1/2 \times 12 \times h = 1/4 \times 12\sqrt{[4(h+2)^2 - 12^2]}$

$\Rightarrow 6h = 3\sqrt{(4h^2 + 16h + 16 - 144)}$

$\Rightarrow 2h = \sqrt{(4h^2 + 16h - 128)}$

On squaring both sides we get,

$\Rightarrow 4h^2 = 4h^2 + 16h - 128$

$\Rightarrow 16h - 128 = 0$

$\Rightarrow 16h = 128$

$\Rightarrow h = \frac{128}{16}$

$\Rightarrow h = 8$ cm

Now,

Area of a triangle = 1/2 × Base × Height

= 1/2 × 12 cm × 8 cm

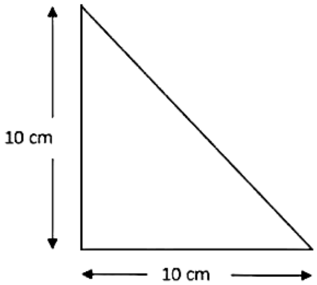
= 1/2 × 96 $cm^2$

= 48 $cm^2$

**Question: 19**

**Solution:**

Given: Equal sides (i.e., base and perpendicular) = 10 cm




We know that,

Area of a triangle = 1/2 × Base × Height

Area of a triangle = 1/2 × 10 cm × 10 cm

Area of a triangle = 50 $cm^2$

Now,

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

⇒ $10^2 + 10^2 = Hypotenuse^2$

⇒ $Hypotenuse^2 = 100 + 100$

⇒ $Hypotenuse^2 = 200\ cm^2$

⇒ Hypotenuse= $10\sqrt{2}$ cm

⇒ Hypotenuse= 14.1 cm

Now,

Perimeter of triangle = 10 + 10 + 14.1 cm

= 24.1 cm

**Question: 20**

**Solution:**

Given: AB = BC = AC = a (let) = 10 cm

BD = 8 cm

Now,

Area of an equilateral triangle (ΔABC) = $\frac{\sqrt{3}}{4} \times a^2$

$= \frac{\sqrt{3}}{4} \times 10^2$

$= 25\sqrt{3}\ cm^2$

$= 43.3\ cm^2$

Now, in ΔDBC

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

⇒ $DC^2 + DB^2 = BC^2$

$\Rightarrow DC^2 = BC^2 - BD^2$

$\Rightarrow DC^2 = 10^2 - 8^2$

$\Rightarrow DC^2 = 100-64$

$\Rightarrow DC^2 = 36\ cm^2$

$\Rightarrow DC = 6$ cm

Now,

Area of a triangle (ΔDBC) = 1/2 × Base × Height

= 1/2 × DC × BC

= 1/2 × 6 cm × 8 cm

= 1/2 × 48 $cm^2$

= 24 $cm^2$

Now,

Area of shaded region = ΔABC - ΔDBC

= 43.3 $cm^2$ – 24 $cm^2$

= 19.3 $cm^2$

## Exercise : 17B

**Question: 1**

**Solution:**

Given: Perimeter = 80 m

Breadth = 16 m


We know that,

Perimeter of a rectangle = 2(length + breadth)

⇒ 80 m = 2(length + 16 m)

$\Rightarrow \frac{80}{2}m = \text{length} + 16\,m$

⇒ 40m = length + 16 m

⇒ Length = 40 m – 16 m

⇒ Length = 24 m

Now,

Area of rectangle = Length × Breadth

= 24 m × 16 m

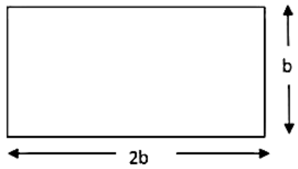
= 384 $m^2$

**Question: 2**

**Solution:**

Given: Length of park (l) = 2 × breadth(b) = 2b

Perimeter of park = 840 m




We know that,

Perimeter of a rectangle = 2(length + breadth)

$\Rightarrow 840 \text{ m} = 2(2b + b)$

$\Rightarrow \frac{840}{2} \text{m} = 2b + b$

$\Rightarrow 420 \text{ m} = 3b$

$\Rightarrow b = \frac{420}{3} \text{m}$

$\Rightarrow b = 140\text{m}$

Now,

$l = 2b = 2 \times 140 \text{ m} = 280 \text{ m}$

Hence,

Area of rectangle = Length × Breadth

$= 140 \text{ m} \times 280 \text{ m}$

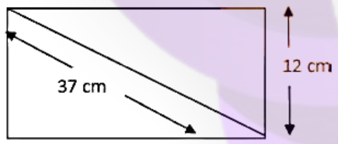
$= 39200 \text{ m}^2$

**Question: 3**

**Solution:**

Given: Breadth (b) = 12 cm

Diagonal = 37 cm




Let length be l cm

We know that,

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

$\Rightarrow l^2 + 12^2 = 37^2$

$\Rightarrow l^2 = 37^2 - 12^2$

$\Rightarrow l^2 = 1369 \text{ cm}^2 - 144 \text{ cm}^2$

$\Rightarrow l^2 = 1225 \text{ cm}^2$

$\Rightarrow l = 35 \text{ cm}$

Now,

Area of rectangle = Length × Breadth

= 35 cm × 12 cm

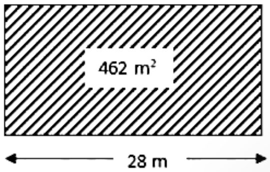
= 420 $cm^2$

**Question: 4**

**Solution:**

Given: Area = 462 $m^2$

Length = 28 m




We know that,

Area of rectangle = Length × Breadth

⇒ 462 $m^2$ = 28 m × Breadth

$$\Rightarrow \text{ Breadth } = \frac{462 \text{ m}^2}{28 \text{ m}}$$

⇒ Breadth = 16.5 m

Now,

Perimeter of a rectangle = 2(length + breadth)

= 2(28 m + 16.5 m)

= 2 × 44.5 m

= 89 m

**Question: 5**

**Solution:**

Given: Cost of fencing lawn = Rs 65 per metre.

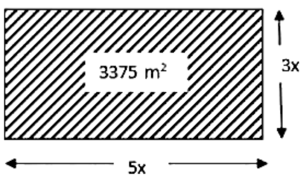
Area of lawn = 3375 $m^2$

Length: Breadth = 5: 3

Let,

Length = 5x

Breadth = 3x




We know that,

Area of lawn = Length × Breadth

⇒ 3375 $m^2$ = 5x × 3x

$\Rightarrow 3375 \text{ m}^2 = 15x^2$

$\Rightarrow x^2 = \frac{3375}{15} \text{m}^2$

$\Rightarrow x^2 = 225 \text{ m}^2$

$\Rightarrow x = 15 \text{ m}$

Therefore,

Length = 5x = 5 × 15 = 75 m

Breadth = 3x = 3 × 15 = 45 m

Now,

Perimeter of lawn = 2(length + breadth)

= 2(75 m + 45 m)

= 2 × 120 m

= 240 m

Hence,

Cost of Fencing = 240 m × Rs 65 per meter

= Rs 15600

**Question: 6**

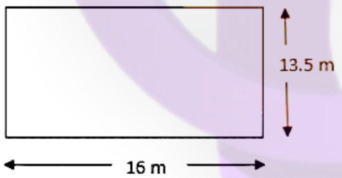
**Solution:**

Given: Cost of covering = Rs 60 per metre.

Breadth of carpet = 75 cm = 0.75 m

Length of room = 16 m

Breadth of room = 13.5 m




We know that,

Area of room = Length × Breadth

= 16 m × 13.5 m

$= 216 \text{ m}^2$

Now,

$\text{Length of carpet} = \frac{\text{Area of room}}{\text{Breadth of carpet}}$

$= \frac{216 \text{ m}^2}{0.75 \text{ m}}$

= 288 m

Now,

Cost of covering the floor = 288 m × Rs 60 per meter

= Rs 17280

**Question: 7**

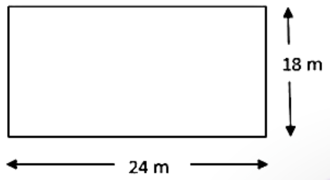
**Solution:**

Given: Length of carpet = 2.5 m

Breadth of carpet = 80 cm = 0.8 m

Length of hall = 24 m

Breadth of hall = 18 m




We know that,

Area of hall = Length × Breadth

= 24 m × 18 m

= 432 $m^2$

And,

Area of carpet = Length × Breadth

= 2.5 m × 0.8 m

= 2 $m^2$

Now,

Number of carpets $= \frac{\text{Area of hall}}{\text{Area of carpet}}$

$= \frac{432 \text{ m}^2}{2 \text{ m}^2}$

= 216 carpets

**Question: 8**

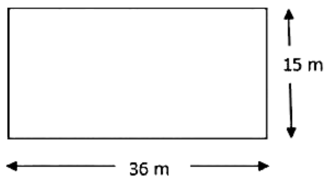
**Solution:**

Given: Length of verandah = 36 m

Breadth of verandah = 15 m

Length of stones = 6 dm = 0.6 m

Breadth of stones = 5 dm = 0.5 m




We know that,

Area of verandah = Length × Breadth

$= 36\ m \times 15\ m$

$= 540\ m^2$

And,

Area of stones = Length × Breadth

$= 0.6\ m \times 0.5\ m$

$= 0.3\ m^2$

Now,

$$\text{Number of stones} = \frac{\text{Area of verandah}}{\text{Area of stones}}$$

$$= \frac{540\ m^2}{0.3\ m^2}$$

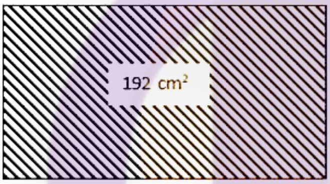
= 1800 stones

**Question: 9**

**Solution:**

Given: Area of rectangle = $192\ cm^2$

Perimeter of rectangle = 56 cm




Let,

Length be l cm

And, breadth be b cm

Now,

Area of rectangle = Length × Breadth

$\Rightarrow 192\ cm^2 = l\ cm \times b\ cm$

$$\Rightarrow l\ cm = \frac{192\ cm^2}{b\ cm}$$

Perimeter of rectangle = 2(length + breadth)

$\Rightarrow 56\ cm = 2(l\ cm + b\ cm)$

Now, substituting the value of l in this we get,

$$56 = 2\left(\frac{192}{b} + b\right)$$

$$\Rightarrow 56 = 2\left(\frac{192 + b^2}{b}\right)$$

$$\Rightarrow \frac{56}{2} = \frac{192 + b^2}{b}$$

$$\Rightarrow 28 = \frac{192 + b^2}{b}$$

$\Rightarrow 28b = 192 + b^2$

$\Rightarrow b^2 - 28b + 192 = 0$

$\Rightarrow b^2 - 16b - 12b + 192 = 0$

$\Rightarrow b(b - 16) - 12(b - 16) = 0$

$\Rightarrow (b - 12)(b - 16) = 0$

This gives us two equations,

i. $b - 12 = 0$

$\Rightarrow b = 12$

ii. $b - 16 = 0$

$\Rightarrow b = 16$

Let b = 12 cm

$$\Rightarrow l\,\text{cm} = \frac{192\ \text{cm}^2}{12\ \text{cm}} = 16\ \text{cm}$$

Hence,

Length = 16 cm

Breadth = 12 cm

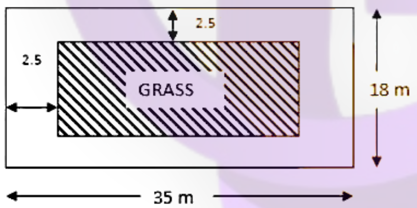
**Question: 10**

**Solution:**

Given:

Length of park = 35 m

Breadth of park = 18 m




Now,

Length to be covered = 35 – (2.5 + 2.5)

= 30 m

Breadth to be covered = 18 – (2.5 + 2.5)

= 13 m

Area of park = Length × Breadth

= 30 m × 13 m

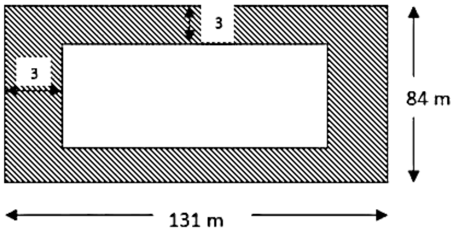
= 390 $m^2$

**Question: 11**

**Solution:**Since gravel path is 3 m wide all around,

∴ Length of plot with path = 125 + (3 + 3)= 131 m

Breadth of plot with path = 78 + (3 + 3)= 84 m




Now,

Area of the rectangular plot without path= L × B⇒ Area of the rectangular plot without path = 125 × 78 = 9750 m²Area of rectangular plot with path = L × B⇒ Area of the rectangular plot with path = 131 × 84 = 11004 m²Area of the path = Area of the rectangular plot with path - Area of the rectangular plot without path = 11004 - 9750
= 1254 m²Cost of gravelling 1 m² path = Rs 75Cost of gravelling 1254 m² path = Rs 75 × 1254
= Rs 94050

**Question: 12**

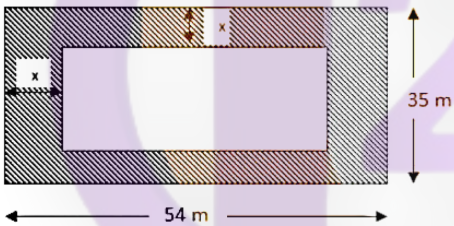
**Solution:**

Given:

Length of field = 54 m

Breadth of field = 35 m

Let width of the path be x m




Area of field = Length × Breadth

= 54 m × 35 m

= 1890 m²

Therefore,

Length of field without path = 54 - (x + x)

= 54 - 2x

Breadth of field without path = 35 - (x + x)

= 35 - 2x

Therefore,

Area of field without path = Length without path × Breadth without path

= (54 - 2x) × (35 - 2x)

= $1890 - 70x - 108x + 4x^2$

$= 1890 - 178x + 4x^2$

Now,

Area of path = Area of field - Area of field without path

$\Rightarrow 420 = 1890 - (1890 - 178x + 4x^2)$

$\Rightarrow 420 = 1890 - 1890 + 178x - 4x^2$

$\Rightarrow 420 = 178x - 4x^2$

$\Rightarrow 4x^2 - 178x + 420 = 0$

$\Rightarrow 2x^2 - 89x + 210 = 0$

$\Rightarrow 2x^2 - 84x - 5x + 210 = 0$

$\Rightarrow 2x(x - 42) - 5(x - 42) = 0$

$\Rightarrow (x - 42)(2x - 5) = 0$

This gives us two equations,

i. $x - 42 = 0$

$\Rightarrow x = 42$

ii. $2x - 5 = 0$

$\Rightarrow x = \frac{5}{2}$

Since, width of park cannot be more than breadth of field

Therefore, width of park = 42 m

**Question: 13**

**Solution:**

Given:

Length : Breadth 9 : 5

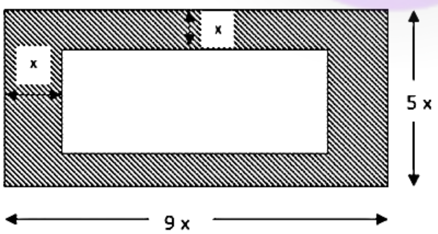
Width of the path = 3.5 m

Area of path = 1911 $m^2$

Let,

Length of field = 9x

Breadth of field = 5x




Area of field = Length × Breadth

$= 9x \times 5x$

$= 45\ x^2$

Therefore,

Length of field without path = 9x - (3.5 + 3.5)

= 9x - 7

Breadth of field without path = 5x - (3.5 + 3.5)

= 5x - 7

Therefore,

Area of field without path = Length without path × Breadth without path

= (9x - 7) × (5x - 7)

= $45x^2 - 35x - 63x + 49$

= $45x^2 - 98x + 49$

Now,

Area of path = Area of field - Area of field without path

⇒ $1911 = 45x^2 - (45x^2 - 98x + 49)$

⇒ $1911 = 45x^2 - 45x^2 + 98x - 49$

⇒ 1911 = 98x - 49

⇒ 98x = 1911 + 49

⇒ 98x = 1960

⇒ x = 20

Hence,

Length of field = 9x = 9 × 20 = 180 m

Breadth of field = 5x = 5 × 20 = 100 m

**Question: 14**

**Solution:**

Given:

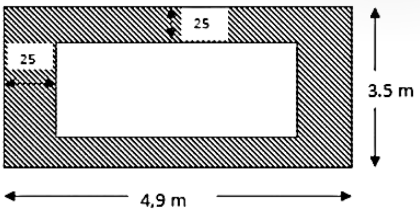
Length = 4.9 m

Breadth = 3.5 m

Margin = 25 cm = 0.25 m

Breadth of carpet = 80 cm = 0.8 m

Cost = Rs 80 per meter




Now,

Length to be carpeted = 4.9 m - (0.25 + 0.25) m

= 4.4 m

Breadth to be carpeted = 3.5 m - (0.25 + 0.25) m

= 3 m

Therefore,

Area to be carpeted = Length to be carpeted × Breadth to be carpeted

= 4.4 m × 3 m

= 13.2 $m^2$

Area of carpet = Area to be carpeted = 13.2 $m^2$

Now,

$$\text{Length of carpet} = \frac{\text{Area of carpet}}{\text{Breadth of carpet}}$$

$$\text{Length of carpet} = \frac{13.2 \text{ m}^2}{0.8 \text{ m}}$$

= 16.5 m

Now,

Cost of 1 m carpet = Rs 80

Therefore,

Cost of 16.5 m carpet = Rs 80 × 16.5 m

= Rs 1,320

**Question: 15**

**Solution:**

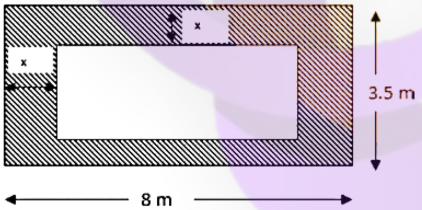
Given:

Length = 8 m

Breadth = 5 m

Border = 12 $m^2$

Let the width be x m




Area of floor = Length × Breadth

= 8 m × 5 m

= 40 $m^2$

Now,

Length without border = 8 m - (x + x) m

= (8 – 2x) m

Breadth without border = 5 m - (x + x) m

= (5 – 2x) m

Therefore,

Area without border = Length without border × Breadth without border

$= (8 - 2x) \times (5 - 2x)$

$= 40 - 16x - 10x + 4x^2$

Area of border = Area of floor - Area without border

$\Rightarrow 12 = 40 - (40 - 16x - 10x + 4x^2)$

$\Rightarrow 12 = 40 - 40 + 16x + 10x - 4x^2$

$\Rightarrow 12 = 26x - 4x^2$

$\Rightarrow 4x^2 - 26x + 12 = 0$

$\Rightarrow 4x^2 - 24x - 2x + 12 = 0$

$\Rightarrow 4x(x-6) - 2(x-6) = 0$

$\Rightarrow (x-6)(4x-2) = 0$

This gives us two equations,

i. $x - 6 = 0$

$\Rightarrow x = 6$

ii. $4x - 2 = 0$

$\Rightarrow x = 1/2$

Since,

Border cannot be greater than carpet

Hence, width of border is 1/2 m = 50 cm

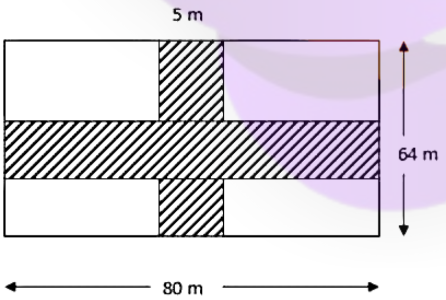
**Question: 16**

**Solution:**

Length = 80 m

Breadth = 64 m

Width of road = 5 m




Area of horizontal road = $5 \text{ m} \times 80 \text{ m} = 400 \text{ m}^2$

Area of vertical road = $5 \text{ m} \times 64 \text{ m} = 320 \text{ m}^2$

Area of common part to both roads = $5 \text{ m} \times 5 \text{ m} = 25 \text{ m}^2$

Now,

Area of roads to be gravelled = Area of horizontal road + Area of vertical road - Ar part to both roads

$= 400\ m^2 + 320\ m^2 - 25\ m^2$

$= 695\ m^2$

Cost of gravelling = $695\ m^2 \times$ Rs 40 per $m^2$

= Rs 27800

**Question: 17**

**Solution:**

Given:

Length of walls = 14 m

Breadth of walls = 10 m

Height of walls = 6.5 m

Length of windows = 1.5 m

Breadth of windows = 1 m

Length of doors = 2.5 m

Breadth of doors = 1.2 m

Cost = Rs 35 per $m^2$

Now,

Area of four walls = 2(Length of walls × Height of walls) + 2(Breadth of walls × Height of walls)

$= 2(14 \times 6.5) + 2(10 \times 6.5)$

$= 182\ m^2 + 130\ m^2$

$= 312\ m^2$

Area of two doors = 2(Length of doors × Breadth of doors)

$= 2(2.5 \times 1.2)$

$= 6\ m^2$

Area of four windows = 4(Length of windows × Breadth of windows)

$= 4(1.5 \times 1)$

$= 6\ m^2$

Therefore,

Area to be painted = Area of 4 walls–(Area of 2 doors + Area of 4 windows)

$= 312\ m^2 - (6\ m^2 + 6\ m^2)$

$= 300\ m^2$

Cost of painting = $300\ m^2 \times$ Rs 35 per $m^2$

= Rs 10500

**Question: 18**

**Solution:**

Given:

Length = 12 m

Cost per meter = Rs 30

Total cost = Rs 7560

Cost per meter for floor = Rs 25

Total cost for floor = Rs 2700

Let height be h

Now,

Area of the floor $= \frac{\text{Total cost}}{\text{Cost per meter}}$

$= \frac{2700}{25}$

$= 108 \text{ m}^2$

Breadth $= \frac{\text{Area of the floor}}{\text{Length}}$

$= \frac{108}{12}$

= 9 m

Area of walls $= \frac{\text{Total cost}}{\text{Cost per meter}}$

$= \frac{7560}{30}$

$= 252 \text{ m}^2$

Area of 4 walls = 2(Length of walls × Height of walls) + 2(Breadth of walls × Height of walls)

⇒ 252 = 2(12 × h) + 2(9 × h)

⇒ 252 = 24h + 18h

⇒ 252 = 42h

⇒ h = 6 m

Therefore,

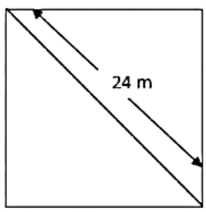
Dimensions = 12 m × 9 m × 6 m

**Question: 19**

**Solution:**

Given:

Diagonal = 24 m




Let the side of square be s

Area of square = 1/2 × Diagonal$^2$

$= 1/2 \times 24^2$

$= 288\ m^2$

Area of square = $side^2$

$\Rightarrow 288\ m^2 = s^2$

$\Rightarrow s = 12\sqrt{2}\ m$

$\Rightarrow s = 16.92\ m$

Therefore,

Perimeter of square = $4 \times 16.92$

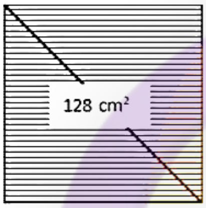
$= 67.68\ m$

**Question: 20**

**Solution:**

Given:

Area = $128\ cm^2$




Let the side of square be s

Area of square = $1/2 \times Diagonal^2$

$\Rightarrow 128 = 1/2 \times Diagonal^2$

$\Rightarrow Diagonal^2 = 2 \times 128$

$\Rightarrow Diagonal^2 = 256$

$\Rightarrow$ Diagonal= 16 cm

Area of square = $side^2$

$\Rightarrow 128\ m^2 = s^2$

$\Rightarrow s = 8\sqrt{2}\ cm$

$\Rightarrow s = 11.28\ cm$

Therefore,

Perimeter of square = $4 \times 11.28$

$= 45.12\ cm$

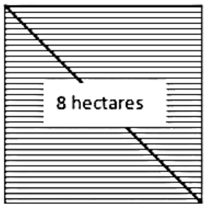
**Question: 21**

**Solution:**

Given:

Area = 8 hectares = $0.08\ km^2$

Speed = 4 km per hr




Let the side of square be s

Area of square = $1/2 \times \text{Diagonal}^2$

$\Rightarrow 0.08 = 1/2 \times \text{Diagonal}^2$

$\Rightarrow \text{Diagonal}^2 = 2 \times 0.08$

$\Rightarrow \text{Diagonal}^2 = 0.16$

$\Rightarrow$ Diagonal= 0.04 km

$$\text{Time taken} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{0.04\text{ km}}{4\text{ km per hr}}$$

= 0.01 hr

= $(0.01 \times 60)$ mins

= 6 mins

Therefore,

Time taken = 6 mins

**Question: 22**

**Solution:**

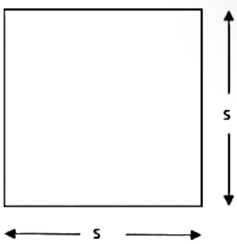
Given:

Rate = Rs 900 per hectare

Total Cost = Rs 8100

Rate of fencing = Rs 18 per metre

Let the side of square field be s




Now,

$$\text{Area} = \frac{\text{Total Cost}}{\text{Rate}}$$

$$= \frac{8100}{900}$$

= 9 hectares = 90000 $m^2$

Area = side$^2$

⇒ 90000 m$^2$ = side$^2$

⇒ side = 300 m$^2$

Now,

Perimeter = 4 × side

= 4 × 300 m$^2$

= 1200m$^2$

Therefore,

Cost of fencing = 1200 m$^2$ × Rs 18 per metre

= Rs 21600

**Question: 23**

**Solution:**

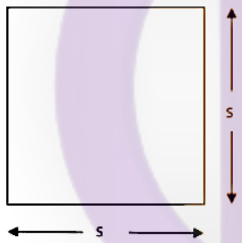
Given:

Rate = RS. 14 per metre

Total Cost = RS. 28000

Rate of mowing = RS. 54 per 100 m$^2$

Let the side of square field be s




Now,

$$\text{Perimeter} = \frac{\text{Total Cost}}{\text{Rate}}$$

$$= \frac{28000}{14}$$

= 2000 m

Perimeter = 4 × side

⇒ 2000 m = 4 × s

$$\Rightarrow s = \frac{2000}{4}$$

⇒ s = 500 m

Now,

Area = side$^2$

= (500 m) $^2$

= 250000 m$^2$

Therefore,

Cost of mowing 100 $m^2$ = Rs 54

Cost of mowing 1 $m^2$ = Rs $\frac{54}{100}$

Cost of mowing 250000 $m^2$ = Rs $\frac{54}{100} \times 250000$

= Rs 135000

**Question: 24**

**Solution:**

Given:

BD = 24 cm

AL = 9 cm

CM = 12 cm

In ΔADB,

Area of ΔADB = 1/2 × BD × AL

= 1/2 × 24 cm × 9 cm

= 108 $cm^2$

In ΔCDB,

Area of ΔCDB = 1/2 × BD × CM

= 1/2 × 24 cm × 12 cm

= 144 $cm^2$

Now,

Area of quadrilateral ABCD = Area of ΔADB + Area of ΔADB

= 108 $cm^2$ + 144 $cm^2$

= 252 $cm^2$

**Question: 25**

**Solution:**

Given:

BC = 26 cm

DC = 26 cm

AD = 24 cm

BD = 26 cm

In ΔBCD,

Area of ΔBCD(equilateral) $= \frac{\sqrt{3}}{4} \times \text{side}^2$

$= \frac{\sqrt{3}}{4} \times 26^2$

= 292.37 $cm^2$

In ΔADB,

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

$\Rightarrow AB^2 + AD^2 = DB^2$

$\Rightarrow AB^2 = DB^2 - AD^2$

$\Rightarrow AB^2 = 26^2 - 24^2$

$\Rightarrow AB^2 = 676 - 576$

$\Rightarrow AB^2 = 100$

$\Rightarrow$ AB= 10 cm

Area of ΔADB = 1/2 × AB × AD

= 1/2 × 10 cm × 24 cm

= 120 $cm^2$

Now,

Area of quadrilateral ABCD = Area of ΔADB + Area of ΔBCD

= 120$cm^2$ + 292.37 $cm^2$

= 412.37 $cm^2$

And,

Perimeter of quadrilateral ABCD = AB + BC + CD + DA

= 10 cm + 26 cm + 26 cm + 24 cm

= 86 cm

**Question: 26**

**Solution:**

Given:

AC = 15 cm

AB = 17 cm

AD = 9 cm

CD = 12 cm

In ΔACB (right-angled),

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

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

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

$\Rightarrow BC^2 = 17^2 - 15^2$

$\Rightarrow BC^2 = 289 - 225$

$\Rightarrow BC^2 = 64$

$\Rightarrow$ BC= 8 cm

Area of ΔACB = 1/2 × BC × AC

= 1/2 × 8 cm × 15 cm

= 60 $cm^2$

In ΔADC,

Area of $\Delta ADC = 1/2 \times AD \times CD$

$= 1/2 \times 9\ cm \times 12\ cm$

$= 54\ cm^2$

Now,

Area of quadrilateral ABCD = Area of $\Delta ACB$ + Area of $\Delta ADC$

$= 60\ cm^2 + 54\ cm^2$

$= 114\ cm^2$

And,

Perimeter of quadrilateral ABCD = AB + BC + CD + DA

= 17 cm + 8 cm + 12 cm + 9 cm

= 46 cm

**Question: 27**

**Solution:**

Given:

DB = 20 cm

AB = 42 cm

AD = 34 cm

CD = 29 cm

CB = 21 cm

In $\Delta ABD$(scalene),

Area of a scalene triangle = $\sqrt{(s(s-AB)(s-BD)(s-AD))}$

Where, $s = \frac{AB + BD + AD}{2}$

$s = \frac{42 + 20 + 34}{2} cm$

$\Rightarrow s = \frac{96}{2} cm$

$\Rightarrow s = 48\ cm$

Now,

Area of a scalene triangle = $\sqrt{(48cm \times (48-42)cm \times (48-20)cm \times (48-34)cm)}$

$= \sqrt{(48\ cm \times 6\ cm \times 28\ cm \times 14\ cm)}$

$= \sqrt{112896}\ cm^2$

$= 336\ cm^2$

Similarly,

In $\Delta BCD$ (scalene),

Area of a scalene triangle = $\sqrt{(s(s-BC)(s-CD)(s-BD))}$

Where, $s = \frac{BC + BD + CD}{2}$

$s = \frac{29 + 20 + 21}{2} cm$

$\Rightarrow s = \frac{70}{2}$ cm

$\Rightarrow$ s = 35 cm

Now,

Area of a scalene triangle = √(35 cm × (35-29)cm × (35-20)cm × (35-21)cm)

= √(35 cm × 6 cm × 15 cm × 14 cm)

= √44100 $cm^2$

= 210 $cm^2$

Now,

Area of quadrilateral ABCD = Area of ΔABD + Area of ΔBCD

= 336 $cm^2$ + 210 $cm^2$

= 546 $cm^2$

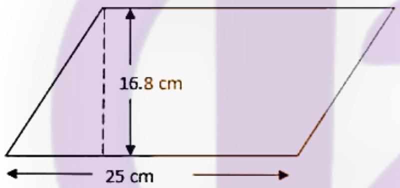
**Question: 28**

**Solution:**

Given:

Base = 25 cm

Height = 16.8 cm




Now,

Area of parallelogram = Base × Height

= 25 cm × 16.8 cm

= 420 $cm^2$

**Question: 29**

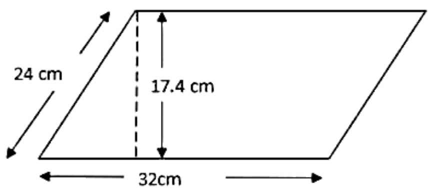
**Solution:**

Given:

Longer side = 32 cm

Shorter side = 24 cm

Distance between Longer sides = 17.4 cm




Now,

Area of parallelogram = Longer side × Distance between Longer sides

= 32 cm × 17.4 cm

= 556.8 cm²

Also,

Area of parallelogram = Shorter side × Distance between Shorter sides

⇒ 556.8 cm² = 24 cm × x cm

$\Rightarrow x = \frac{556.8}{24}$

⇒ x = 23.2 cm

Hence,

Distance between Shorter sides = 23.2 cm

**Question: 30**

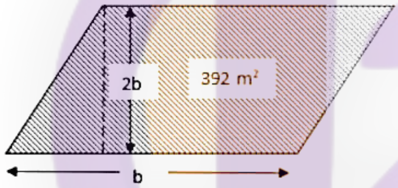
**Solution:**

Given:

Area = 392 m²

Base = b (let)

Height = 2b




Now,

Area of parallelogram = Base × Height

⇒ 392 = b × 2b

⇒ $392 = 2b^2$

⇒ $b^2 = 196$

⇒ b = 14 cm

Hence,

Base = 14 cm

Altitude = 2 × 14 = 28 cm

**Question: 31**

**Solution:**

Given:

AB = 34 cm

BC = 20 cm

AC = 42 cm

In ΔABC (scalene),

Area of $\Delta ABC = \sqrt{(s(s-AB)(s-BC)(s-AC))}$

Where, $s = \frac{AB + BC + AC}{2}$

$s = \frac{42 + 20 + 34}{2}$ cm

$\Rightarrow s = \frac{96}{2}$ cm

$\Rightarrow s = 48$ cm

Now,

Area of a scalene triangle = $\sqrt{(48cm \times (48-42)cm \times (48-20)cm \times (48-34)cm)}$

$= \sqrt{(48 \text{ cm} \times 6 \text{ cm} \times 28 \text{ cm} \times 14 \text{ cm})}$

$= \sqrt{112896} \text{ cm}^2$

$= 336 \text{ cm}^2$

Now,

Area of parallelogram ABCD = 2 × Area of $\Delta ABC$

$= 2 \times 336 \text{ cm}^2$

$= 672 \text{ cm}^2$

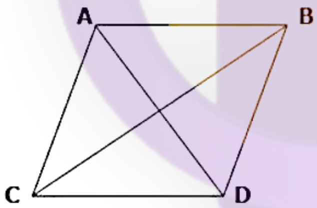
**Question: 32**

**Solution:**

Given:

Length of diagonal 1 ($d_1$) = 30 cm

Length of diagonal 2 ($d_2$) = 16 cm




Area of rhombus = $1/2 \times d_1 \times d_2$

$= 1/2 \times 30 \text{ cm} \times 16 \text{ cm}$

$= 240 \text{ cm}^2$

Now,

Side of rhombus = $1/2 \times \sqrt{(d_1^2 + d_2^2)}$

$= 1/2 \times \sqrt{(30^2 + 16^2)}$

$= 1/2 \times \sqrt{(900 + 256)}$

$= 1/2 \times \sqrt{1156}$

$= 1/2 \times 34$

$= 17$ cm

Therefore,

Perimeter of rhombus = 4 × Side of rhombus

$= 4 \times 17$ cm

$= 68$ cm

**Question: 33**

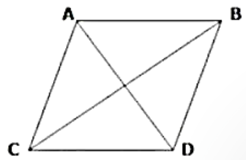
**Solution:**

Given:

Perimeter of rhombus = 60 cm

Length of diagonal 1 ($d_1$) = 18 cm

Let, Length of diagonal 2 be $d_2$




(i) Perimeter of rhombus = $4 \times$ side

$\Rightarrow 60 = 4 \times$ side

$\Rightarrow \text{side} = \frac{60}{4} = 15 \text{ cm}$

Now,

Side of rhombus = $1/2 \times \sqrt{(d_1^2 + d_2^2)}$

$\Rightarrow 15 = 1/2 \times \sqrt{(18^2 + d_2^2)}$

$\Rightarrow 15 = 1/2 \times \sqrt{(324 + d_2^2)}$

$\Rightarrow 15 \times 2 = \sqrt{(324 + d_2^2)}$

$\Rightarrow 30 = \sqrt{(324 + d_2^2)}$

Squaring both sides,

$\Rightarrow 900 = 324 + d_2^2$

$\Rightarrow 900-324 = d_2^2$

$\Rightarrow d_2^2 = 576$

$\Rightarrow d_2 = 24$

Therefore,

Length of other diagonal = 24 cm

(ii) Area of rhombus = $1/2 \times d_1 \times d_2$

$= 1/2 \times 18 \text{ cm} \times 24 \text{ cm}$

$= 216 \text{ cm}^2$

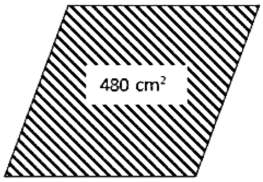
**Question: 34**

**Solution:**

Given:

Area of rhombus = 480 $cm^2$

Length of diagonal 1 ($d_1$) = 48 cm




Let, Length of diagonal 2 be $d_2$

(i) Area of rhombus = $1/2 \times d_1 \times d_2$

$\Rightarrow 480 = 1/2 \times 48 \times d_2$

$$\Rightarrow d_2 = \frac{480 \times 2}{48}$$

$\Rightarrow d_2 = 20$ cm

Therefore,

Length of other diagonal = 20 cm

(ii) Side of rhombus = $1/2 \times \sqrt{(48^2 + 20^2)}$

$= 1/2 \times \sqrt{(2304 + 400)}$

$= 1/2 \times \sqrt{2704}$

$= 1/2 \times 52$

= 26 cm

Therefore,

Side of rhombus = 26 cm

(iii) Perimeter of rhombus = 4 × side

= 4 × 26 cm

= 104 cm

Therefore,

Perimeter of rhombus = 104 cm

**Question: 35**

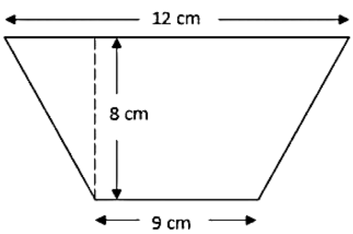
**Solution:**

Given:

Side 1 = 12 cm

Side 2 = 9 cm

Distance between sides = 8 cm



Now,

Area of trapezium = 1/2 × Sum of parallel sides × Distance between them

= 1/2 × (12 + 9) × 8

= 1/2 × 21 × 8

= 84 $cm^2$

**Question: 36**

**Solution:**

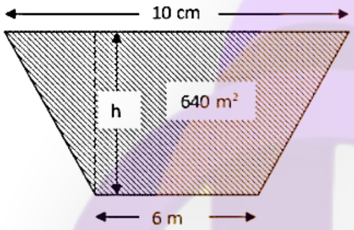
Given:

Top width = 10 m

Bottom width = 6 m

Area of cross section = 640 $m^2$

Let the depth be h




Now,

Area of trapezium = 1/2 × Sum of parallel sides × Distance between them

⇒ 640 = 1/2 × (10 + 6) × h

⇒ 640 × 2 = 16 h

⇒ $h = \frac{640 \times 2}{16}$

⇒ h = 80 m

**Question: 37**

**Solution:**

Given:

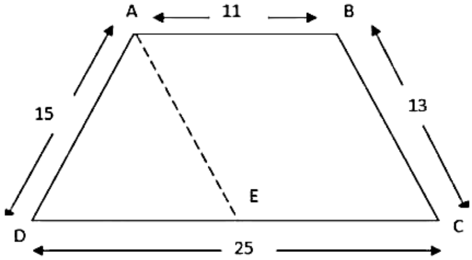
AB (say) = 11 cm

DC (say) = 25 cm

AD (say) = 15 cm

BC (say) = 13 cm

Draw AE ∥ BC




Now the trapezium is divided into a triangle ADE and a parallelogram AECB.

Since, AECB is a parallelogram

Therefore, AE = BC = 13 cm

And, AB = EC

DE = DC − EC( = AB) = 25 − 11 = 14 cm

Now,

We know that,

Area of a scalene triangle (ΔAED) = $\sqrt{(s(s\text{-}AE)(s\text{-}ED)(s\text{-}AD))}$

Where, $s = \frac{AE + ED + AD}{2}$

$s = \frac{13 + 14 + 15}{2} cm$

$\Rightarrow s = \frac{42}{2} cm$

⇒ s = 21 cm

Now,

Area of a scalene triangle = $\sqrt{(21cm \times (21\text{-}13)cm \times (21\text{-}14)cm \times (21\text{-}15)cm)}$

$= \sqrt{(21cm \times 8cm \times 7cm \times 6cm)}$

$= \sqrt{7056}\ cm^2$

$= 84\ cm^2$

Also,

Area of a triangle = 1/2 × base × height

⇒ 84 = 1/2 × 14 × height

$\Rightarrow height = \frac{84 \times 2}{14}$

⇒ height = 12 cm

Now,

Area of a parallelogram = base × height

= 11 cm × 12 cm

$= 132\ cm^2$

Now,

Area of Trapezium ABCD = Area of ΔADE + Area of a parallelogram ABCE

$= 84\ cm^2 + 132\ cm^2$

$= 216\ cm^2$