Concepts of Perimeter and Area
Ex 21A

Perimeter

• **Square:** Perimeter = 4a	• **Circle** Perimeter = 2 × pi × r
• **Rectangle:** Perimeter = 2a + 2b	• **Parallelogram:** Perimeter = 2a + 2b
• **Triangle:** Perimeter = a + b + c	• **Trapezoid:** Perimeter = a + b + c + d = 2m + c + d
• **Rhombus:** Perimeter = 4a	• **Regular N-gon:** Perimeter = ns, n = # of sides
• **Ellipse:** Perimeter $= 2\,pi\sqrt{\dfrac{a^2 + b^2}{2}}$	

Q1

Answer:

Perimeter of a rectangle $= 2 \times (\text{Length} + \text{Breadth})$

(i) Length = 16.8 cm

Breadth = 6.2 cm

Perimeter $= 2 \times (\text{Length} + \text{Breadth})$

$= 2 \times (16.8 + 6.2) = 46 \text{ cm}$

(ii) Length = 2 m 25 cm

= (200+25) cm   (1 m = 100 cm)

= 225 cm

Breadth = 1 m 50 cm

= (100+50) cm   (1 m = 100 cm)

= 150 cm

Perimeter $= 2 \times (\text{Length} + \text{Breadth})$

$= 2 \times (225 + 150) = 750 \text{ cm}$

(iii) Length = 8 m 5 dm

= (80+5) dm   (1 m = 10 dm)

= 85 dm

Breadth = 6 m 8 dm

= (60+8) dm   (1 m = 10 dm)

= 68 dm

Perimeter $= 2 \times (\text{Length} + \text{Breadth})$

$= 2 \times (85 + 68) = 306 \text{ dm}$

Q2

Answer:

Length of the field = 62 m

Breadth of the field = 33 m

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

= 2(62 + 33) m =190 m

Q3

Cost of fencing per metre = Rs 16

Total cost of fencing = Rs (16×190) = Rs 3040

Answer :

Let the length of the rectangle be 5x m.
Breadth of the rectangle = 3x m
Perimeter of the rectangle = 2(l + b)
= 2(5x + 3x) m
= (16x) m
It is given that the perimeter of the field is 128 m.

$$\therefore 16x = 128$$
$$\Rightarrow x = \frac{128}{16} = 8$$
$$\therefore \text{Length } = \left(5 \times 8\right) = 40\text{m}$$
$$\text{Breadth } = \left(3 \times 8\right) = 24\text{m}$$

Q4
Answer :

Total cost of fencing = Rs 1980
Rate of fencing = Rs 18 per metre

$$\text{Perimeter of the field} = \frac{\text{Total cost}}{\text{Rate}} = \frac{\text{Rs } 1980}{\text{Rs } 18/\text{m}} = \left(\frac{1980}{18}\right)\text{m} = 110 \text{ m}$$

Let the length of the field be x metre.
Perimeter of the field = 2(x + 23) m

$$\therefore 2(x + 23) = 110$$
$$\Rightarrow (x + 23) = 55$$
$$x = (55 - 23) = 32$$
Hence, the length of the field is 32 m.

Q5
Answer :

Total cost of fencing = Rs 3300
Rate of fencing = Rs 25/m
$$\text{Perimeter of the field} = \frac{\text{Total cost}}{\text{Rate of fencing}} = \left(\frac{\text{Rs } 3300}{\text{Rs } 25/\text{m}}\right) = \frac{3300}{25}\text{m} = 132 \text{ m}$$

Let the length and the breadth of the rectangular field be 7x and 4x, respectively.
Perimeter of the field = 2(7x + 4x) = 22x

It is given that the perimeter of the field is 132 m.

$$\therefore 22x = 132$$
$$\Rightarrow x = \frac{132}{22} = 6$$
$$\therefore \text{Length of the field } = \left(7 \times 6\right)\text{m} = 42 \text{ m}$$
$$\text{Breadth of the field } = \left(4 \times 6\right)\text{m} = 24 \text{ m}$$

Q6
Answer :

(i) Side of the square = 3.8 cm
  Perimeter of the square = (4×side)
= (4×3.8) = 15.2 cm

(ii) Side of the square = 4.6 cm
  Perimeter of the square = (4×side)
= (4×4.6) = 18.4 cm

(iii) Side of the square = 2 m 5 dm
= (20+5) dm   (1 m = 10 dm)
= 25 dm
  Perimeter of the square = (4×side)
= (4×25) = 100 dm

Q7

Answer :

Total cost of fencing = Rs 4480
Rate of fencing = Rs 35/m
Perimeter of the field = $\frac{\text{Total cost}}{\text{Rate}} = \frac{\text{Rs } 4480}{\text{Rs } 35/m} = \frac{4480}{35}$ m $= 128$ m

Let the length of each side of the field be x metres.
Perimeter = $(4x)$ metres
$\therefore 4x = 128$
$\Rightarrow x = \frac{128}{4} = 32$

Hence, the length of each side of the field is 32 m.

Q8
Answer :

Side of the square field = 21m
Perimeter of the square field = (4×21) m
$\qquad\qquad = 84$ m

Let the length and the breadth of the rectangular field be $4x$ and $3x$, respectively.
Perimeter of the rectangular field = $2(4x + 3x) = 14x$

Perimeter of the rectangular field = Perimeter of the square field

$\therefore 14x = 84$
$\Rightarrow x = \frac{84}{14} = 6$

$\therefore$ Length of the rectangular field $= (4 \times 6)$ m $= 24$ m
Breadth of the rectangular field $= (3 \times 6)$ m $= 18$ m

Q9
Answer :

(i) Sides of the triangle are 7.8 cm, 6.5 cm and 5.9 cm.
Perimeter of the triangle = (First side + Second side + Third Side) cm
$\qquad\qquad = (7.8 + 6.5 + 5.9)$ cm
$\qquad\qquad = 20.2$ cm

(ii) In an equilateral triangle, all sides are equal.
Length of each side of the triangle = 9.4 cm
$\therefore$ Perimeter of the triangle = $(3 \times$ Side) cm
$\qquad\qquad = (3 \times 9.4)$ cm
$\qquad\qquad = 28.2$ cm

(iii) Length of two equal sides = 8.5 cm
Length of the third side = 7 cm
$\therefore$ Perimeter of the triangle = {$(2 \times$ Equal sides) + Third side} cm
$\qquad\qquad = \{(2 \times 8.5) + 7\}$ cm
$\qquad\qquad = 24$ cm

Q10
Answer :

(i) Length of each side of the given pentagon = 8 cm
$\therefore$ Perimeter of the pentagon = (5×8) cm
$\qquad\qquad = 40$ cm

(ii) Length of each side of the given octagon = 4.5 cm
$\therefore$ Perimeter of the octagon = (8×4.5) cm
$\qquad\qquad = 36$ cm

(iii) Length of each side of the given decagon = 3.6 cm
$\therefore$ Perimeter of the decagon = (10×3.6) cm
$\qquad\qquad = 36$ cm

Q11

Answer :

(i) Perimeter of the figure = Sum of all the sides

=(27 + 35 + 35 + 45) cm

= 142 cm

(ii) Perimeter of the figure = Sum of all the sides

=(18 + 18 + 18 + 18) cm

= 72 cm

(iii) Perimeter of the figure = Sum of all the sides

=(8 + 16 + 4 + 12 + 12 + 16 + 4) cm

= 72 cm

Concepts of Perimeter and Area
Ex 21B

Q1

Answer:

(i) Radius, $r = 28$ cm

$\therefore$ Circumference of the circle, $C = 2\pi r$

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

$$= 176 \text{ cm}$$

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

(ii) Radius, $r = 10.5$ cm

$\therefore$ Circumference of the circle, $C = 2\pi r$

$$= \left(2 \times \frac{22}{7} \times 10.5\right)$$

$$= 66 \text{ cm}$$

Hence, the circumference of the given circle is 66 cm.

(iii) Radius, $r = 3.5$ m

$\therefore$ Circumference of the circle, $C = 2\pi r$

$$= \left(2 \times \frac{22}{7} \times 3.5\right)$$

$$= 22 \text{ m}$$

Hence, the circumference of the given circle is 22 m.

Q2

Answer:

(i)

Circumference $= 2\pi r$ $\qquad = \pi\left(2r\right)$ $\qquad = \pi \times$ Diameter of the

circle $\left(d\right)$ $\quad \left(\text{Diameter} = 2 \times radius\right)$

$\Rightarrow$ Circumference $=$ Diameter $\times \pi$ Diameter of the given circle is 14 cm.

Circumference of the given circle $= 14 \times \pi \Rightarrow \left(14 \times \frac{22}{7}\right) = 44$ cm Circumference of

the given circle is 44 cm.

(ii)

Circumference $= 2\pi r$ $\qquad = \pi\left(2r\right)$ $\qquad = \pi \times$ Diam$eter$ of the

circle$\left(d\right)$ $\quad \left(\text{Diameter} = 2 \times \text{Radius}\right)$

$\Rightarrow$ Circumference $=$ Diameter $\times \pi$ Diameter of the given circle is 35 cm.

$\Rightarrow$ Circumference of the given circle $= 35 \times \pi \Rightarrow \left(35 \times \frac{22}{7}\right) = 110$ cm Circumference

of the given circle is 110 cm.

(iii)

Circumference $= 2\pi r$ $\qquad = \pi\left(2r\right)$ $\qquad = \pi \times$ Diameter of the

circle$\left(d\right)$ $\quad \left(\text{Diameter} = 2 \times Radi\text{us}\right)$

$\Rightarrow$ Circumference $=$ Diameter $\times \pi$ Diameter of the given circle is 10.5 m.

Circumference of the given circle $= 10.5 \times \pi \Rightarrow \left(10.5 \times \frac{22}{7}\right) = 33$ m Circumference

of the given circle is 33 m.

Q3

Answer:

Let the radius of the given circle be r cm.
Circumference of the circle = 176 cm
Circumference = $2\pi r$
$\therefore 2\pi r = 176$
$\Rightarrow r = \frac{176}{2\pi}$
$\Rightarrow r = \left(\frac{176}{2} \times \frac{7}{22}\right)$
$\Rightarrow r = 28$
The radius of *the* given circle is 28 cm.

Q4
Answer:

Let the radius of the circle be r cm.
Diameter $= 2 \times Radius = 2r$ cm
Circumference of the wheel $= 264$ cm
Circumference of the wheel $= 2\pi r$
$\therefore 2\pi r = 264$
$\Rightarrow 2r = \frac{264}{\pi}$
$\Rightarrow 2r = \left(264 \times \frac{7}{22}\right)$
$\Rightarrow 2r = 84$
Diameter of the given wheel *is* 84 cm.

Q5

Answer:

Radius of the wheel $= \dfrac{Diameter \ of \ the \ wheel}{2}$
$\Rightarrow r = \frac{77}{2}$ cm
Circumference of the wheel $= 2\pi r$
$= \left(2 \times \frac{22}{7} \times \frac{77}{2}\right)$
$= 242$ cm

In 1 revolution the wheel covers a distance equal to its circumference.

$\therefore$ Distance covered by *the w*heel in 1 revolution $= 242$ cm
$\therefore$ Distance covered by *the w*heel in 500 revolution$s = (500 \times 242)$ cm
$= 121000$ cm
$= 1210$ m $(100$ cm $= 1$m $)$
$= 1.21$ km $(1000$ m $= 1$ km $)$

Q6
Answer:

Radius of the wheel $\left(r\right) = \dfrac{Diameter \ of \ the \ wheel}{2}$

$r = \frac{70}{2}$ cm $= 35$ cm

Circumference of the wheel $= 2\pi r = \left(2 \times \frac{22}{7} \times 35\right)$
$= 220$ cm
In one revolution, *the* wheel covers *the* distance equal to its circumference.
$\therefore 220$ cm distance $= 1$ revolution
$\therefore 1$ cm distance $= \frac{1}{220}$ revolution

$\therefore 1$ km $\left(\text{or } 100000 \text{ cm}\right)$ distance $= \frac{1 \times 100000}{220}$ revolution $\left(\therefore 1 \text{ km} = 100000 \text{ cm}\right)$

$\therefore 1.65$ km distance $= \frac{1.65 \times 100000}{220}$ revolutions
$= 750$ revolutions
*Thus,t*he wheel will make 750 revolutions to travel 1.65 km.

Q1
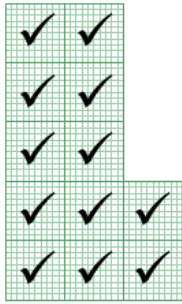
Answer :

The figure contains 12 complete squares.

Area of 1 small square = 1 sq cm

Q2 ∴ Area of the figure = Number of complete squares × Area of the square

$$=(12 \times 1) \text{ sq cm}$$

=12 sq cm

Answer :
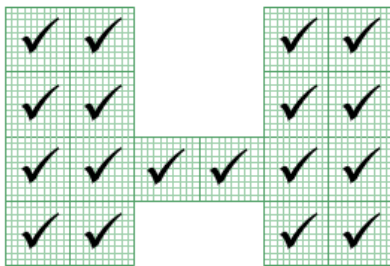
The figure contains 18 complete squares.

Area of 1 small square = 1 sq cm

Q3 ∴ Area of the figure = Number of complete squares × Area of the square

$$=(18 \times 1) \text{ sq cm}$$

=18 sq cm

Answer :
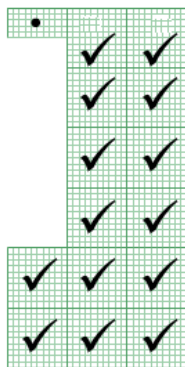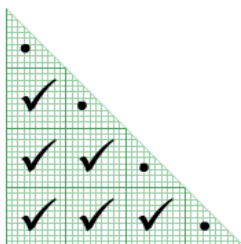

The figure contains 14 complete squares and 1 half square.

Area of 1 small square = 1 sq cm

Q4 ∴ Area of the figure = Number of squares × Area of the square

Answer :

The figure contains 6 complete squares and 4 half squares.
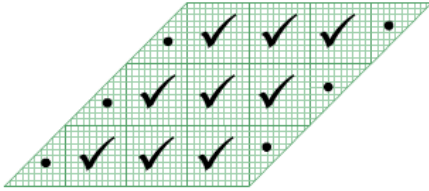
Area of 1 small square = 1 sq cm

∴ Area of the figure = Number of squares × Area of the square

$$=\left[(6 \times 1) + \left(4 \times \tfrac{1}{2}\right)\right] \text{ sq cm}$$
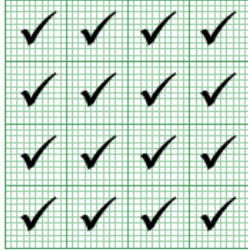
Q5 =8 sq cm

Answer :

The figure contains 9 complete squares and 6 half squares.

   Area of 1 small square = 1 sq cm

   ∴ Area of the figure = Number of squares × Area of the square

$$=\left[\left(9 \times 1\right) + \left(6 \times \tfrac{1}{2}\right)\right] \textbf{ sq cm}$$

    =12 sq cm

Q6

Answer :

The figure contains 16 complete squares.

   Area of 1 small square = 1 sq cm

   ∴ Area of the figure = Number of squares × Area of a square

            =(16×1) sq cm

            =16 sq cm

Q7

Answer :
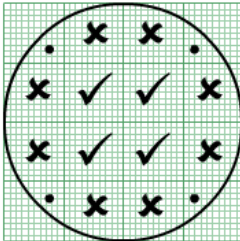
In the given figure, there are 4 complete squares, 8 more than half parts of squares and 4 less than half parts of squares.

We neglect the less than half parts and consider each more than half part of the square as a complete square.

        ∴ Area = (4 + 8) sq cm

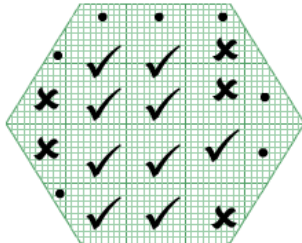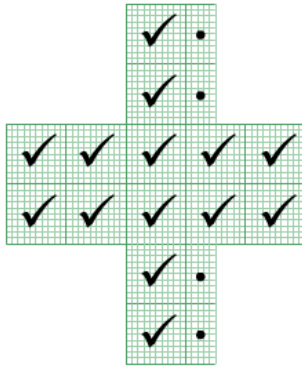   = 12 sq cm

Q8

Answer :

In the given figure, there are 9 complete squares, 5 more than half parts of squares and 7 less than half parts of squares.

We neglect the less than half parts of squares and consider the more than half squares as complete squares.

∴ Area of the figure = (9 + 5) sq cm

                = 14 sq cm

Q9
Answer :

The figure contains 14 complete squares and 4 half squares.

Area of 1 small square = 1 sq cm

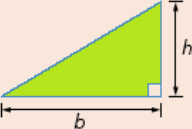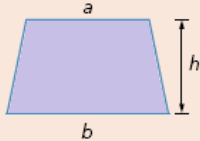Area of the figure = Number of squares $\times$ Area of one square

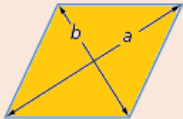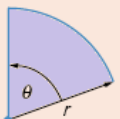$$= \left[\left(14 \times 1 \right) + \left(4 \times \tfrac{1}{2} \right) \right] \text{sq cm}$$

=16 sq cm

Concepts of Perimeter and Area
Ex 21D

The **area** of a shape is a measure of the size of its surface.

Square Area $= l^2$	Rectangle Area $= l \times w$	Triangle Area $= \frac{1}{2}b \times h$	Parallelogram Area $= b \times h$
l	w l	h b	h b
Trapezium Area $= \frac{1}{2}(a+b)h$	Rhombus Area $= \frac{1}{2}a \times b$	Circle Area $= \pi r^2$	Sector Area $= \frac{\theta}{360}\pi r^2$
a h b	b a	r	θ r

Perimeter

• **Square:** a a Perimeter = 4a	• **Circle** r Perimeter = 2 × pi × r
• **Rectangle:** a b Perimeter = 2a + 2b	• **Parallelogram:** b a Perimeter = 2a + 2b
• **Triangle:** a b c Perimeter = a + b + c	• **Trapezoid:** c b m d 1/2 h a Perimeter = a + b + c + d = 2m + c + d
• **Rhombus:** a a a a Perimeter = 4a	• **Regular N-gon:** s s a Perimeter = ns, n = # of sides
• **Ellipse:** b a Perimeter = 2 pi $\sqrt{\frac{a^2 + b^2}{2}}$	

Q1

Answer :

(i) Length = 46 cm

Breadth = 25 cm

Area of the rectangle = (Length ×Breadth) sq units

$$= (46 \times 25) \text{ cm}^2 = 1150 \text{ cm}^2$$

(ii) Length = 9 m

Breadth = 6 m

Area of the rectangle = (Length ×Breadth) sq units

$$= (9 \times 6) \text{ m}^2 = 54 \text{ m}^2$$

(iii) Length = 14.5 m

Breadth = 6.8 m

Area of the rectangle = (Length ×Breadth) sq units

$$= \left(\frac{145}{10} \times \frac{68}{10}\right) \text{ m}^2 = \frac{9860}{100} \text{ m}^2 = 98.60 \text{ m}^2$$

(iv) Length = 2 m 5 cm

$$= (200+5) \text{ cm} \quad (1 \text{ m} = 100 \text{ cm })$$

$$= 205 \text{cm}$$

Breadth = 60 cm

Area of the rectangle = (Length ×Breadth) sq units

$$= (205 \times 60) \text{ cm}^2 = 12300 \text{ cm}^2$$

Q2

Answer :

Side of the square plot = 14 m
Area of the square plot = (Side)² sq units
$$= (14)^2 \text{ m}^2$$
$$= 196 \text{ m}^2$$

Q3
Answer :

Length of the table = 2 m 25 cm
$$= (2 + 0.25) \text{ m} \quad (100 \text{ cm} = 1 \text{ m})$$
$$= 2.25 \text{ m}$$
Breadth of the table = 1 m 20 cm
$$= (1 + 0.20) \text{ m} \quad (100 \text{ cm} = 1 \text{ m})$$
$$= 1.20 \text{ m}$$
Area of the table = (Length × Breadth) sq units
$$= (2.25 \times 1.20) \text{ m}^2$$

$$= \left(\frac{225}{100} \times \frac{120}{100} \right) \text{ m}^2$$
$$= 2.7 \text{ m}^2$$

Q4
Answer :

Length of the carpet = 30 m 75 cm
$$= (30 + 0.75) \text{ cm} \quad (100 \text{ cm} = 1 \text{ m})$$
$$= 30.75 \text{ m}$$
Breadth of the carpet = 80 cm
$$= 0.80 \text{ m} \quad (100 \text{ cm} = 1 \text{ m})$$

Area of carpet = (Length × breadth) sq units

$$= \left(30.75 \times 0.80 \right) \text{ m}^2$$
$$= \left(\frac{3075}{100} \times \frac{80}{100} \right) \text{ m}^2$$
$$= 24.6 \text{ m}^2$$

Cost of 1 m² carpet = Rs 150
Cost of 24.6 m² carpet = Rs (24.6 × 150)
$$= \text{Rs } 3690$$

Q5
Answer :

Length of the sheet of paper = 3 m 24 cm = 324 cm
Breadth of the sheet of paper = 1 m 72 cm = 172 cm
Area of the sheet = (Length × Breadth)
$$= \left(324 \times 172 \right) \text{ cm}^2$$
$$= 55728 \text{ cm}^2$$

Length of the piece of paper required to make 1 envelope = 18 cm
Breadth of the piece of paper required to make 1 envelope = 12 cm
Area of the piece of paper required to make 1 envelope = (18 × 12) cm²
$$= 216 \text{ cm}^2$$

$$\text{No. of envelopes that can be made} = \frac{\text{Area of the sheet}}{\text{Area of the piece of paper required to make 1 envelope}}$$

$$\Rightarrow \text{No. of envelopes that can be made} = \frac{55728}{216} = 258 \text{ envelopes}$$

Q6

Answer :

Length of the room = 12.5 m
Breadth of the room = 8 m
Area of the room = (Length×Breadth)
$\quad\quad\quad$ =(12.5×8) m2 = 100 m2
Side of the square carpet = 8 m
Area of the carpet = (Side)^2
$\quad\quad\quad\quad$ = 8^2 m^2
$\quad\quad\quad\quad$ = 64 m^2

Area of the floor which is not carpeted = Area of the room − Area of the carpet
$\quad\quad\quad\quad\quad\quad$ = (100 − 64) m^2
$\quad\quad\quad\quad\quad\quad$ = 36 m^2

Q7

Answer :

Length of the road = 150 m = 15000 cm
Breadth of the road = 9 m = 900 cm
Area of the road = (Length×Breadth)
$$= 15000 \times 900 \ cm^2$$
$$= 13500000 \ cm^2$$
Length of the brick = 22.5 cm
Breadth of the brick = 7.5 cm
Area of one brick = (Length×Breadth)
$$= \left(22.5 \times 7.5\right) \ cm^2$$
$$= 168.75 \ cm^2$$

$$Number \ of \ bricks \ = \ \frac{Area \ of \ the \ road}{Area \ of \ one \ brick} \ = \ \frac{13500000}{168.75} = 80000 \ bricks$$

Q8

Answer :

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

Let length of required carpet be *x* m.
Breadth of the carpet = 75 cm
$\quad\quad\quad\quad\quad$ = 0.75 m $\quad\quad$ (100 cm = 1 m)
Area of the carpet = (0.75×x) m^2
$\quad\quad\quad\quad$ = 0.75x m^2
For carpeting the room:
Area covered by the carpet = Area of the room
$\quad$ ⇒0.75x=117⇒x=1170.75⇒x=117×43⇒x=156 m

So, the length of the carpet is 156 m.
Cost of 1 m carpet = Rs 65
Cost 156 m carpet = Rs (156×65)
$\quad\quad\quad\quad\quad$ = Rs 10140

Q9

Answer:

Let the length of the rectangular park be 5x.
∴ Breadth of the rectangular park = 3x
Perimeter of the rectangular field = 2(Length + Breadth)
=2(5x + 3x)
= 16x

It is given that the perimeter of rectangular park is 128 m.
$\Rightarrow 16x = 128$
$\Rightarrow x = \frac{128}{16}$
$\Rightarrow x = 8$

$\text{Length of the park} = \left(5 \times 8\right) \text{m}$
$= 40 \text{ m}$
$\text{Breadth of the park} = \left(3 \times 8\right) \text{m}$
$= 24 \text{ m}$

Area of the park = (Length × Breadth) sq units

$$= \left(40 \times 24\right) \text{m}^2$$
$$= 960 \text{ m}^2$$

Q10
Answer:

Side of the square plot = 64 m
Perimeter of the square plot = $\left(4 \times Side\right) \text{m} = \left(4 \times 64\right) \text{m} = 256 \text{ m}$
Area of the square plot = (Side)^2
= 64^2 m^2
= 4096 m^2

Let the breadth of the rectangular plot be x m.
Perimeter of the rectangular plot = 2(l+b) m
= 2(70+x) m

Perimeter of the rectangular plot = Perimeter of the square plot (Given)
$\Rightarrow 2\left(70 + x\right) = 256$
$\Rightarrow 140 + 2x = 256$
$\Rightarrow 2x = 256 - 140$
$\Rightarrow 2x = 116$
$\Rightarrow x = \frac{116}{2} = 58$
So, the breadth of the rectangular plot is **58 m**.
Area of the rectangular plot = $\left(Length \times Breadth\right) = \left(70 \times 58\right) \text{m}^2 = 4060 \text{ m}^2$
Area of the square plot – Area of the rectangular plot
= (4096 – 4060)
= **36 m^2**

Q11

Answer :

Total cost of cultivating the field = Rs 71400
Rate of cultivating the field = Rs 35/m²

$$\text{Area of the field} = \frac{\text{Total cost of cultivating the field}}{\text{Rate of cultivating}} = \frac{\text{Rs } 71400}{\text{Rs } 35/m^2} = 2040 \text{ m}^2$$

Let the length of the field be x m.

$$\text{Area of the field} = \left(Length \times Width\right) m^2 = \left(x \times 40\right) m^2 = 40x \ m^2$$

It is given that the area of the field is 2040 m².
$$\Rightarrow 40x = 2040$$
$$\Rightarrow x = \frac{2040}{40} = 51$$
$$\therefore \text{Length of the field } = 51 \text{ m}$$

Perimeter of the field = 2(l+b)
= 2(51+40) m
= 182 m
Cost of fencing 1 m of the field = Rs 50
Cost of fencing 182 m of the field = Rs (182×50)
= Rs 9100

Q12
Answer :

Let the width of the rectangle be x cm.
Length of the rectangle = 36 cm
Area of the rectangle = (Length × Width) = (36 × x) cm²
It is given that the area of the rectangle is 540 cm².

$$\Rightarrow 36 \times x = 540$$
$$\Rightarrow x = \frac{540}{36}$$
$$\Rightarrow x = 15$$
$$\therefore \text{Width of the rectangle } = 15 \text{ cm}$$

Perimeter of the rectangle = 2(Length + Width) cm
= 2(36 + 15) cm
= 102 cm

Q13
Answer :

Length of the wall = 4 m = 400 cm
Breadth of the wall = 3 m = 300 cm
Area of the wall = (400×300) cm² = 120000 cm²

Length of the tile = 12 cm
Breadth of the tile = 10 cm
Area of one tile = (12×10) cm² = (120) cm²

$$\text{Number of tiles required to cover the wall} = \frac{\text{Area of the wall}}{\text{Area of one tile}} = \frac{120000}{120} = 1000 \text{ tiles}$$

Cost of 1 tile = Rs 22.50
Cost of 1000 tiles = (1000 × 22.50) = Rs 22500

Thus, the total cost of the tiles is Rs 22500.

Q14

Answer :

Let the length of the rectangle be x cm.
Breadth of the rectangle is 25 cm.
Area of the rectangle = (Length × Breadth) cm^2
$$= (x \times 25) \text{ cm}^2$$
$$= 25x \text{ cm}^2$$

It is given that the area of the rectangle is 600 cm^2.
$$\Rightarrow 25x = 600$$
$$\Rightarrow x = \frac{600}{25} = 24$$
So, the length of the rectangle is 24 cm.
Perimeter of the rectangle = 2(Length + Breadth) units
$$= 2(25 + 24) \text{ cm}$$
$$= 98 \text{ cm}$$

Q15
Answer :

Area of the square $= \left\{ \frac{1}{2} \times \left(Diagonal \right)^2 \right\}$ sq units
$$= \left\{ \frac{1}{2} \times \left(5\sqrt{2} \right)^2 \right\} \text{ cm}^2$$
$$= \left\{ \frac{1}{2} \times \left(5 \right)^2 \times \left(\sqrt{2} \right)^2 \right\} \text{ cm}^2$$
$$= \left\{ \frac{1}{2} \times 25 \times 2 \right\} \text{ cm}^2$$
$$= \left(\frac{1}{2} \times 50 \right) \text{ cm}^2 = 25 \text{ cm}^2$$

Q16
Answer :

(i) Area of rectangle ABDC = Length × Breadth
$$= AB \times AC \qquad (AC = AE - CE)$$
$$= (1 \times 8) \text{m}^2$$
$$= 8 \text{ m}^2$$
Area of rectangle CEFG = Length × Breadth
$$= CG \times GF \qquad (CG = GD + CD)$$
$$= (9 \times 2) \text{m}^2$$
$$= 18 \text{ m}^2$$
Area of the complete figure = Area of rectangle ABDC + Area of rectangle CEFG
$$= (8 + 18) \text{ m}^2$$
$$= 26 \text{ m}^2$$
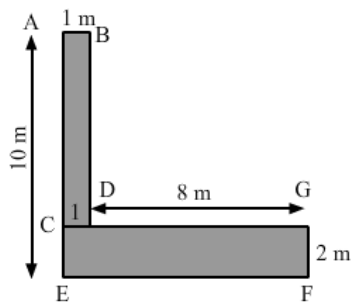
(ii) Area of rectangle AEDC = Length × Breadth

$= ED \times CD$

$= (12 \times 2)m^2$

$= 24 \text{ cm}^2$

Area of rectangle FJIH = Length × Breadth

$= HI \times IJ$

$= (1 \times 9)m^2$

$= 9 \text{ m}^2$

Area of rectangle ABGF = Length × Breadth

$= AB \times AF$ {(AB = FJ − GJ) and AF = EH − (EA + FH)}

$= (7 \times 1.5)m^2$

$= 10.5 \text{ m}^2$

Area of the complete figure = Area of rectangle AEDC + Area of rectangle FJIH + Area of rectangle ABGF

$= (24 + 9 + 10.5) \text{ m}^2$

$= 43.5 \text{ m}^2$
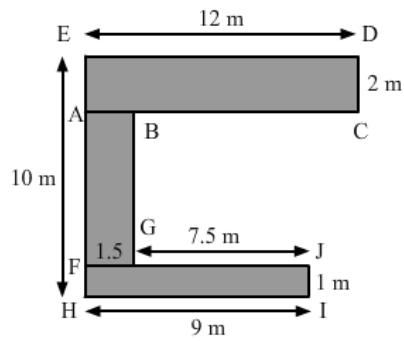
(iii) Area of the shaded portion = Area of the complete figure − Area of the unshaded figure

= Area of rectangle ABCD − Area of rectangle GBFE

$=(CD \times AD) - (GB \times BF)$

$=\{(12 \times 9) - (7.5 \times 10)\}m^2$ (BF = BC − FC)

$=(108 - 75) \text{ m}^2$

$=33 \text{ m}^2$

Q17

Answer :

(i) Area of square BCDE= (Side)²
$$= (CD)^2$$
$$= (3)^2 \text{ cm}^2$$
$$= 9 \text{ cm}^2$$

Area of rectangle ABFK = **Length** × **Breadth**
$$= AK \times AB \qquad [(AB = AC - BC) \text{ and } (AK = AL + LK)$$
$$= (5 \times 1) \text{ cm}^2$$
$$= 5 \text{ cm}^2$$

Area of rectangle MLKG = **Length** × **Breadth**
$$= ML \times MG$$
$$= (2 \times 3) \text{ cm}^2$$
$$= 6 \text{ cm}^2$$

Area of rectangle JHGF= **Length** × **Breadth**
$$= JH \times HG$$
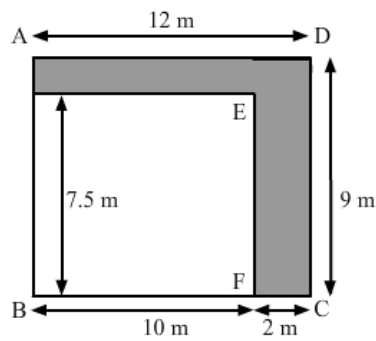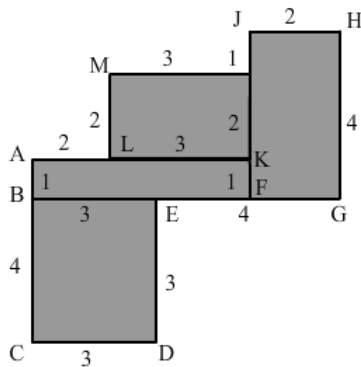$$= (2 \times 4) \text{ cm}^2$$
$$= 8 \text{ cm}^2$$

Area of the figure = Area of rectangle ABFK + Area of rectangle MLKG + Area of rectangle JHGF + Area of square BCDE
$$= (9 + 5 + 6 + 8) \text{ cm}^2$$
$$= 28 \text{ cm}^2$$

(ii) Area of rectangle CEFG= **Length** × **Breadth**
$$= EF \times CE$$
$$= (1 \times 5) \text{ cm}^2 \qquad (CE = EA - AC)$$
$$= 5 \text{ cm}^2$$

Area of rectangle ABDC = **Length** × **Breadth**
$$= AB \times BD$$
$$= (1 \times 2) \text{ cm}^2$$
$$= 2 \text{ cm}^2$$

Area of rectangle HIJG = **Length** × **Breadth**
$$= HI \times IJ$$
$$= (1 \times 2) \text{ cm}^2$$
$$= 2 \text{ cm}^2$$

Area of the figure = Area of rectangle CEFG + Area of rectangle HIJG + Area of rectangle ABDC
$$= (5+2+2) \text{ cm}^2$$
$$= 9 \text{ cm}^2$$
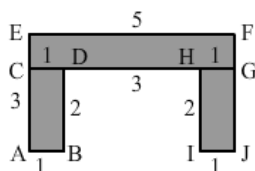
(iii) In the figure, there are 5 squares, each of whose sides are 6 cm in length.

Area of the figure = 5 × Area of square
$$= 5 \times (\text{side})^2$$
$$= 5 \times (6)^2 \text{ cm}^2$$
$$= 180 \text{ cm}^2$$
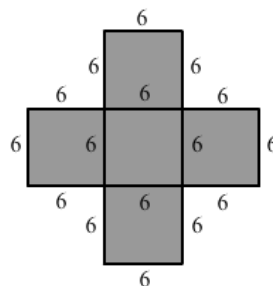
Q1

Answer :

(b) 28 cm

Let the length and the breadth of the rectangle be $7x$ cm and $5x$ cm, respectively.
It is given that the perimeter of the rectangle is 96 cm.
Perimeter of the rectangle = 2(7x+5x) cm

$$\Rightarrow 2\left(7x + 5x\right) = 96$$
$$= 2\left(12x\right) = 96$$
$$= 24x = 96$$
$$\Rightarrow x = \frac{96}{24} = 4$$
$$\therefore \text{ Length } = \left(7 \times 4\right)\text{cm} = 28 \text{ cm}$$

Q2

Answer :

(d) 126 cm
Let length of the rectangle be L cm.
Area of the rectangle = 650 cm^2
Area of the rectangle = (L × 13) cm^2
$$\Rightarrow \left(L \times 13\right) = 650$$
$$\Rightarrow L = \frac{650}{13} = 50$$
Length of the rectangle is 50 cm

Perimeter of the rectangle = 2(Length + Breadth) cm = 2(50+13) cm = 126 cm

Q3

Answer:

(b) Rs 2340

Perimeter of the rectangular field = 2(Length + Breadth)

$$= 2(34 + 18) \text{ m} = 104 \text{ m}$$

Cost of fencing 1 metre = Rs 22.50

Cost of fencing 104 m = Rs (22.50×104) = Rs 2340

Q4

Answer:

(b) 16 m

Total cost of fencing = Rs 2400

Rate of fencing = Rs 30/m

Perimeter of the rectangular field = $\frac{\text{Total cost}}{\text{Rate}} = \frac{\text{Rs 2400}}{\text{Rs 30/m}} = 80 \text{ m}$

Let the breadth of the rectangular field be x m.

Perimeter of the rectangular field = 2(24 + x) m

$$\Rightarrow 2\left(24 + x\right) = 80$$

$$\Rightarrow 48 + 2x = 80$$

$$\Rightarrow 2x = \left(80 - 48\right)$$

$$\Rightarrow 2x = 32$$

$$\Rightarrow x = \frac{32}{2} = 16$$

So, the breadth of the rectangular field is 16 m.

Q5

Answer:

(c) 17 m

Let the length and the breadth of the rectangle be L m and B m, respectively.

Area of the rectangular carpet = ($L \times B$) m²

$$\Rightarrow LB = 120 \qquad \ldots \text{(i)}$$

Perimeter of the rectangular carpet = $2(L + B)$

$$\Rightarrow 2\left(L + B\right) = 46$$

$$\Rightarrow \left(L + B\right) = \frac{46}{2}$$

$$\Rightarrow \left(L + B\right) = 23 \quad \ldots \left(\text{ii}\right)$$

Diagonal of the rectangle $= \sqrt{L^2 + B^2} \text{ m}$

$$= \sqrt{(L + B)^2 - 2LB} \text{ m}$$

$$= \sqrt{(23)^2 - 240} \text{ m} \qquad \left(\text{from equations } \left(\text{i}\right) \text{ and } \left(\text{ii}\right)\right)$$

$$= \sqrt{529 - 240} \text{ m}$$

$$= \sqrt{289} \text{ m}$$

$= 17 \text{ m}$

Q6

Answer :

(a) 48 cm

Let the width and the length of the rectangle be x cm and $3x$ cm, respectively.

Applying Pythagoras theorem:

$$\left(\text{Diagonal}\right)^2 = \left(\text{Length}\right)^2 + \left(\text{Width}\right)^2$$
$$\Rightarrow \left(6\sqrt{10}\right)^2 = \left(3x\right)^2 + \left(x\right)^2$$
$$\Rightarrow 360 = 9x^2 + x^2$$
$$\Rightarrow 360 = 10x^2$$
$$\Rightarrow x^2 = \frac{360}{10}$$
$$\Rightarrow x^2 = 36$$
$$\Rightarrow x = \pm 6$$

Since the width cannot be negative, we will neglect -6.

So, width of the rectangle is 6 cm.
Length of the rectangle = $(3 \times 6) = 18$ **cm**
Perimeter of the rectangle = 2(Length + Breadth) = 2(18 + 6) = 48 cm

Q7
Answer :

(b) 2 : 1

Let the breadth of the plot be b cm.

Let the length of the plot be x cm.
Perimeter of the plot = $3x$ cm

Perimeter of the plot = 2(Length + Breadth)= 2(x + b) cm

$$\Rightarrow 2\left(x + b\right) = 3x$$

$$2x + 2b = 3x$$
$$\Rightarrow 2b = 3x - 2x$$
$$\Rightarrow 2b = x$$
$$\Rightarrow b = \frac{x}{2}$$

$\therefore$ Ratio of the length and the breadth of the plot $= \dfrac{x}{\left(\frac{x}{2}\right)} = \dfrac{x}{x} \times 2 = \dfrac{2}{1}$

$\therefore$ Ratio of the length and the breadth of the plot $= 2 : 1$

Q8
Answer :

(b) 200 cm²

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

$= \left\{ \dfrac{1}{2} \times \left(20\right)^2 \right\}$ cm²

$= \left\{ \dfrac{1}{2} \times \left(20\right) \times \left(20\right) \right\}$ cm²

$= \left(20 \times 10\right)$ cm²

$= 200$ cm²

Q9

Answer :

(c) 20 m

Let one side of the square field be *x* m.

Total cost of fencing a square field = Rs 2000

Rate of fencing the field = Rs 25/m

$$\text{Perimeter of the square field} = \frac{\text{Total cost of fencing the field}}{\text{Rate of fencing the field}} = \frac{\text{Rs }2000}{\text{Rs }25/\text{m}} = \frac{2000}{25}\text{ m} = 80\text{ m}$$

Perimeter of the square field = $(4 \times \text{side})$ = 4*x* m

$\Rightarrow 4x = 80$

$\Rightarrow x = \frac{80}{4}$

$\Rightarrow x = 20$

Each side of the field is 20 m.

Q10
Answer :

(b) 22 cm

$\text{Radius} = \frac{\text{Diameter}}{2} = \frac{7}{2}\text{ cm}$

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

$= 22\text{ cm}$

Q11
Answer :

(a) 28 cm

Circumference of the circle is 88 cm.

Let the radius be *r* cm.

It is given that the circumference of the circle is $\left(2\pi r\right)$ cm.

$\Rightarrow 2\pi r = 88$

$\Rightarrow 2 \times \frac{22}{7} \times r = 88$

$\Rightarrow r = \frac{1}{2} \times \frac{7}{22} \times 88$

$\Rightarrow r = 14$

$\therefore \text{Radius} = 14\text{ cm}$

$\text{Diameter} = \left(2 \times \text{Radius}\right) = \left(2 \times 14\right)\text{ cm} = 28\text{ cm}$

Q12
Answer :

(b) 110 m

$\text{Radius of the wheel} = \frac{\text{Diameter}}{2} = \frac{70}{2} = 35\text{ cm}$

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

The distance covered by the wheel in one revolution is equal to its circumference.

Distance covered by the wheel in 1 revolution $= 220\text{ cm}$

$\therefore$ Distance covered by the wheel in 50 revolution $= \left(50 \times 220\right)\text{cm} = 11000\text{ cm}$

$= 110\text{ m}$

Q13

Answer:

(d) 80000
Length of the road = 150 m = 15000 cm
Breadth of the road = 9 m = 900 cm
Area of the road = (Length × Breadth)
= (15000 × 900) cm²
= 13500000 cm²

Length of the brick = 22.5 cm
Breadth of the brick = 7.5 cm
Area of one brick = (Length × Breadth)
= (22.5 × 7.5) cm²
= 168.75 cm²

$$\text{Number of bricks} = \frac{\text{Area of the road}}{\text{Area of one brick}}$$

$$= \frac{13500000 \text{ cm}^2}{168.75 \text{ cm}^2} = 80000 \text{ bricks}$$

Q14

Answer:

(b) 24.3 m²

Length of the room = 5 m 40 cm = 5.40 m
Breadth of the room = 4 m 50 cm = 4.50 m

$$\text{Area of the room} = \left(\text{Length} \times \text{Breadth}\right) = \left(5.40 \times 4.50\right) \text{m}^2$$

$$= \left(\frac{540}{100} \times \frac{450}{100}\right)\text{m}^2$$

$$= \left(\frac{27}{5} \times \frac{9}{2}\right)\text{m}^2$$

$$= \frac{243}{10} \text{m}^2 = 24.3 \text{ m}^2$$

Q16
Answer:

(b) 64 cm
Side of the square = 16 cm
Perimeter of the square = (4 × side)
= (4 × 16) cm
= 64 cm