Exercise 20G

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

∴ Area of a square > Area of a rectangle

Q9

Answer :

(b) 13500 m^2

Let the length of the rectangular field be $5x$.
Breadth = $3x$
Perimeter of the field = $2(l + b)$ = 480 m (given)
$\Rightarrow 480 = 2(5x + 3x) \Rightarrow 480 = 16x$
$\Rightarrow x = \frac{480}{16} = 30$
∴ Length = $5x = (5 \times 30) = 150$ m
Breadth = $3x = (3 \times 30) = 90$ m
∴ Area of the rectangular park = 150 m × 90 m = 13500 m^2

Q10

Answer :

(a) 6 m

Total cost of carpeting = Rs 6000
Rate of carpeting = Rs 50 per m
∴ Length of the carpet = $\left(\frac{6000}{50}\right)$ m = 120 m
∴ Area of the carpet = $\left(120 \times \frac{75}{100}\right)$ m^2 = 90 m^2 [since 75 cm = $\frac{75}{100}$ m]
Area of the floor = Area of the carpet = 90 m^2
∴ Width of the room = $\left(\frac{\text{Area}}{\text{Length}}\right) = \left(\frac{90}{15}\right)\ \text{m} = 6\ \text{m}$

Q11

Answer :

(a) 84 cm^2

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

Then, $s = \frac{a+b+c}{2} = \left(\frac{13+14+15}{2}\right)$ cm = 21 cm

∴ Area of the triangle = $\sqrt{\mathbf{s(s-a)(s-b)(s-c)}}$ sq. units

$= \sqrt{21(21-13)(21-14)(21-15)}$ cm^2

$= \sqrt{21 \times 8 \times 7 \times 6}$ cm^2

$= \sqrt{3 \times 7 \times 2 \times 2 \times 2 \times 7 \times 2 \times 3}$ cm^2

= (2 × 2 × 3 × 7) cm^2

= 84 cm^2

Q12

Answer :

(b) 48 m^2

Base = 12 m

Height = 8 m

Area of the triangle = $\left(\frac{1}{2} \times \mathbf{Base} \times \mathbf{Height}\right)$ sq. units

$= \left(\frac{1}{2} \times 12 \times 8\right)$ m^2

= 48 m^2

Q13

Answer :

(b) 4 cm

Area of the equilateral triangle = $4\sqrt{3}$ cm^2

We know:

Area of an equilateral triangle = $\frac{\sqrt{3}}{4}(\text{side})^2$ sq. units

$\therefore$ Side of the equilateral triangle = $\left[\sqrt{\left(\frac{4\times\text{Area}}{\sqrt{3}}\right)}\right]$ cm

$= \left[\sqrt{\left(\frac{4\times4\sqrt{3}}{\sqrt{3}}\right)}\right]$ cm = $\left(\sqrt{4\times4}\right)$ cm = $\left(\sqrt{16}\right)$ cm = 4 cm

Q14

Answer :

(c) $16\sqrt{3}$ cm^2

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

$\therefore$ Area of the equilateral triangle = $\frac{\sqrt{3}}{4}(\text{Side})^2$ sq. units

$= \frac{\sqrt{3}}{4}(8)^2$ cm^2

$= \left(\frac{\sqrt{3}}{4}\times64\right)$ cm^2 = $16\sqrt{3}$ cm^2

Q15

Answer :

(b) $2\sqrt{3}$ cm^2

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

Diagonal of an equilateral triangle = $\frac{\sqrt{3}}{2}a$ cm

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

$\Rightarrow a = \frac{\sqrt{6}\times2}{\sqrt{3}} = \frac{\sqrt{3}\times\sqrt{2}\times2}{\sqrt{3}} = 2\sqrt{2}$ cm

Area of the equilateral triangle = $\frac{\sqrt{3}}{4}a^2$

$= \frac{\sqrt{3}}{4}(2\sqrt{2})^2$ cm^2 = $\left(\frac{\sqrt{3}}{4}\times8\right)$ cm^2 = $2\sqrt{3}$ cm^2

Q16

Answer :

(b) 72 cm^2

Base of the parallelogram = 16 cm

Height of the parallelogram = 4.5 cm

$\therefore$ Area of the parallelogram = Base $\times$ Height

= (16 $\times$ 4.5) cm^2 = 72 cm^2

Q17

Answer :

(b) 216 cm^2

Length of one diagonal = 24 cm

Length of the other diagonal = 18 cm

$\therefore$ Area of the rhombus = $\frac{1}{2}$ $\times$ (Product of the diagonals)

$= \left(\frac{1}{2}\times24\times18\right)$ cm^2 = 216 cm^2

Q18

Answer :

(c) 154 cm^2

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

Circumference = $2\pi r$

********** END **********