

Exercise 20.2

Q.1 Find the Perimeters of the rectangles whose lengths and breadths are given below:

(i) 7cm, 5cm

(ii) 5cm, 4cm

(iii) 7.5cm, 4.5cm

Solution (i) here, length of rectangle = 7cm
breadth = 5cm

$$\begin{aligned}\text{Perimeter} &= 2(l+b) \\ &= 2(7+5) = 2 \times 12 \\ &= 24 \text{ cm.}\end{aligned}$$

(ii) here, length = 5cm, breadth = 4cm

$$\begin{aligned}P &= 2(l+b) \\ P &= 2(5+4) = 2 \times 9 = 18 \text{ cm}\end{aligned}$$

(iii) here, $l = 7.5 \text{ cm}$, $b = 4.5 \text{ cm}$

$$\begin{aligned}\therefore P &= 2(l+b) \\ &= 2(7.5+4.5) = 2 \times 12 \\ &= 24 \text{ cm.}\end{aligned}$$

Q.2 Find the Perimeters of the squares whose sides are given below

(i) 10 cm

(ii) 5 m

(iii) = 115.5 cm

Solution: (i) side of square = 10cm

$$\begin{aligned}\therefore \text{Perimeter} &= 4 \times \text{side} = 4 \times 10 \text{ cm} \\ &= 40 \text{ cm.}\end{aligned}$$

(i) Side of square = 5 m.

$$\begin{aligned}\therefore \text{Perimeter of square} &= 4 \times \text{side} \\ &= 4 \times 5 \text{ m} = 20 \text{ m.}\end{aligned}$$

(ii) Side of square = 115.5 cm

$$\begin{aligned}\therefore \text{Perimeter} &= 4 \times \text{side} \\ &= 4 \times 115.5 = 462 \text{ cm}\end{aligned}$$

Q.3 Find the side of the square whose Perimeter is

(i) 16 cm

(ii) 40 cm

(iii) 22 cm

Solution: (i) Perimeter of square = 16 cm

$$\therefore 4 \times \text{side} = 16 \text{ cm}$$

$$\begin{aligned}\Rightarrow \text{side} &= \frac{16}{4} \\ &= 4 \text{ cm}\end{aligned}$$

(ii) Perimeter of square = 40 cm

$$4 \times \text{side} = 40$$

$$\begin{aligned}\Rightarrow \text{side} &= \frac{40}{4} \\ &= 10 \text{ cm}\end{aligned}$$

(iii) Perimeter of square = 22 cm

$$\therefore 4 \times \text{side} = 22$$

$$\Rightarrow \text{side} = \frac{22}{4} = \frac{11}{2} = 5.5 \text{ cm.}$$

Q 4: Find the breadth of the rectangle whose perimeter is 360 cm and whose length is

(i) 116 cm

(ii) 140 cm

(iii) 102 cm

Solution: (i) $\therefore$ Perimeter = 360 cm

$$l = 116 \text{ cm}$$

$$\Rightarrow 2(l+b) = 360$$

$$\Rightarrow 2(116+b) = 360$$

$$\Rightarrow 232 + 2b = 360$$

$$\Rightarrow 2b = 360 - 232 = 128$$

$$\Rightarrow b = \frac{128}{2} = 64 \text{ cm}$$

(ii) $l = 140 \text{ cm} \Rightarrow 2(140+b) = 360$

$$\Rightarrow 280 + 2b = 360$$

$$\Rightarrow 2b = 80 \Rightarrow b = 40 \text{ cm}$$

(iii) $l = 102 \text{ cm} \Rightarrow 2(102+b) = 360$

$$\Rightarrow 204 + 2b = 360$$

$$\Rightarrow 2b = 360 - 204 = 156$$

$$\Rightarrow b = \frac{156}{2} = 78 \text{ cm}$$

Q.5 A Rectangular piece of lawn is 55 m wide and 98 m long. Find the length of the fence around it.

Sol: Since, breadth of field = 55 m.

length = 98 m.

$$\begin{aligned}\therefore \text{length of fence} &= 2(4+6) \\ &= 2(98+55) = 2 \times 153 \text{ cm} \\ &= 306 \text{ cm}\end{aligned}$$

Q.6 The side of square field is 65 m. What is the length of the fence required all around it?

Solution:

$$\begin{aligned}\text{side of square field} &= 65 \text{ m} \\ \text{length of fence} &= 4 \times \text{side} \\ &= 4 \times 65 = 260 \text{ m}\end{aligned}$$

Q.7 Two sides of a triangle are 15 cm and 20 cm. The Perimeter of the triangle is 50 cm. What is the third side?

Solution:

$$\begin{aligned}\text{sides of triangle} &= 15 \text{ cm}, 20 \text{ cm} \\ \text{Perimeter} &= 50 \text{ cm}\end{aligned}$$

$$\begin{aligned}\text{Third side} &= \text{Perimeter} - \text{Sum of lengths of two sides} \\ &= 50 - (15 + 20) \\ &= 50 - 35 = 15 \text{ cm}\end{aligned}$$

Q.8 A wire of length 20 m is to be folded in the form of a rectangle. How many rectangles can be formed by folding the wire if the sides are positive integers in meters.

Solution: we are given that

$$\text{length of wire} = 20 \text{ m}$$

$$\therefore p = 20 \text{ m}$$

$$\Rightarrow 2(l+b) = 20 \text{ m}$$

$$\Rightarrow l+b = 10 \text{ m}$$

$\therefore$ The possible dimensions are (1m, 9m) (2m, 8m)
(3m, 7m) (4m, 6m) (5m, 5m)

Hence, five rectangles are possible.

Q.9 A square piece of land has each side equals to 100 cm.
If 3 layers of metal wire has to be used to fence it,
what is the length of the wire needed?

Sol: side of square land = 100 cm.

$$\begin{aligned} \text{length of wire used for 1 layer} &= \text{Perimeter of square} \\ &= 4 \times 100 \\ &= 400 \text{ cm} \end{aligned}$$

$$\therefore \text{length of wire required for 3 layers} = 3 \times 400 = 1200 \text{ cm}$$

Q.10 Shikha runs around a square of side 75 m. Priya runs around a rectangle with length 60 m and breadth 45 m. who covers the smaller distance.

Solution: Distance covered by Shikha = $4 \times 75 \text{ m}$
 $= 300 \text{ m}$

$$\begin{aligned} \text{Distance covered by Priya} &= 2(l+b) \\ &= 2(60+45) \quad \left\{ \begin{array}{l} l=60\text{m} \\ b=45\text{m} \end{array} \right\} \\ &= 2 \times 105 \\ &= 210 \text{ m} \end{aligned}$$

$\therefore$ Priya covers smaller distance.

Q.11 The dimensions of a photograph are $30\text{cm} \times 20\text{cm}$. What length of wooden frame is needed to frame the picture.

Solution: $\therefore l = 30\text{cm}$
 $b = 20\text{cm}$

$$\begin{aligned} \therefore \text{Length of wooden frame} &= 2(l+b) \\ &= 2(30+20) = 100 \text{ cm.} \end{aligned}$$

Q.12 The length of rectangular field is 100m . If its perimeter is 300m . What is its breadth.

Solution: Length of field = 100m

Perimeter = 300m

$$\Rightarrow 2(l+b) = 300$$

$$\Rightarrow l+b = 150 \text{ m}$$

$$\Rightarrow b = 150 - 100 = 50 \text{ m.}$$

Q.13 To fix fence wires in a garden, 70 m long and 50 m wide, Arvind bought metal pipes for posts. He fixed a post every 5 metres apart. Each post was 2 m long. What is the total length of the pipes he bought for the posts.

Solution:

$$\begin{aligned}\text{length of garden} &= 70 \text{ m} \\ \text{breadth} &= 50 \text{ m} \\ \therefore \text{Perimeter} &= 2(l+b) = 2(70+50) \\ &= 240 \text{ m}\end{aligned}$$

$$\therefore \text{Distance between two posts} = 5 \text{ m}$$

$$\therefore \text{Number of posts required} = \frac{240}{5} = 48$$

Now, we are given length of each post = 2 m

$$\begin{aligned}\therefore \text{length of 48 posts} &= 48 \times 2 \text{ m} \\ &= 96 \text{ m}.\end{aligned}$$

Q.14 Find the cost of fencing a rectangular park of length 175 m and breadth 125 m at the rate of Rs. 12 per meter.

Solution:

$$\begin{aligned}\text{length} &= 175 \text{ m} \\ \text{breadth} &= 125 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{length of fencing} &= 2(l+b) = 2(175+125) \\ &= 600 \text{ m}.\end{aligned}$$

$$\therefore \text{Total Cost of fencing} = 600 \times 12 \\ = \text{Rs. } 7200$$

Q.15 The Perimeter of a regular pentagon is 100 cm. How long is each side?

Solution: Perimeter of regular pentagon = 100 cm

$$\therefore \text{each side} = \frac{\text{Perimeter}}{5}$$

$$= \frac{100}{5} = 20 \text{ cm.}$$

Q.16 Find the Perimeter of a regular hexagon with each side measuring 8 m.

Solution:

$$\begin{aligned} \text{Perimeter of regular hexagon} &= 6 \times \text{length of each side} \\ &= (6 \times 8) \text{ m} \\ &= 48 \text{ m.} \end{aligned}$$

Q.17 A rectangular piece of land measures 0.7 km by 0.5 km. Each side is to be fenced with four rows of wires. What length of the wire is needed?

Solution: length of land = 0.7 km

breadth = 0.5 km

$$\begin{aligned} \text{length of wire needed for one row} &= \text{Perimeter of land} \\ &= 2(0.7 + 0.5) = 2.4 \text{ km} \end{aligned}$$

(11)

Therefore, length of wire required for 4 rows
 $= 4 \times 2.4 \text{ km}$
 $= 9.6 \text{ km}$

Q.18 Arneet buys 9 square paving slabs, each with a side $\frac{1}{2} \text{ m}$. He lays them in the form of a square.

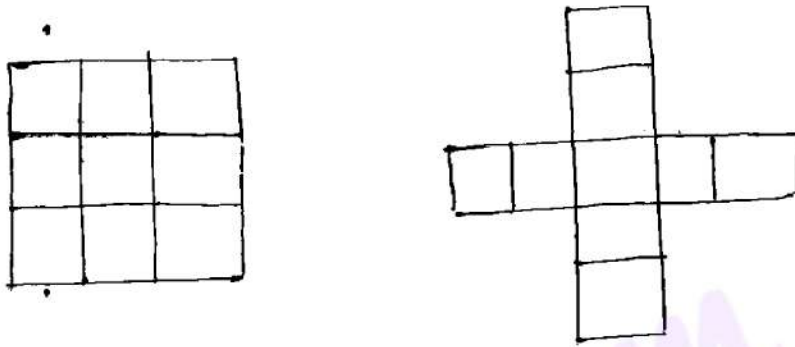


Fig 20.15

- (i) What is the perimeter of his arrangement?
- (ii) Shari does not like his arrangement. She gets him to lay them out like a cross. What is perimeter of her arrangement?
- (iii) Which has greater perimeter?
- (iv) Arneet wonders, if there is a way of getting an even greater perimeter. Can you find a way of doing this? (The paving slabs must meet along complete edges they can not be broken)

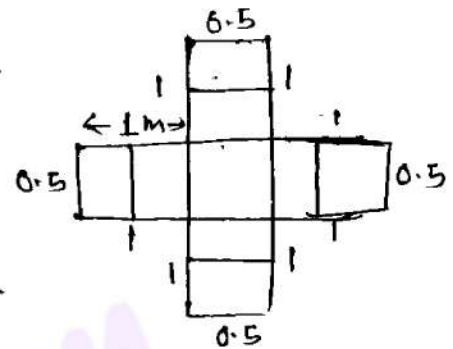
Solution

(1) In Aneet's arrangement, each side of square
 $= 3 \times \frac{1}{2} \text{ m} = \frac{3}{2} = 1.5$

$$\therefore \text{Perimeter} = 4 \times 1.5 \\ = 6 \text{ m.}$$

(ii)

$$\begin{aligned} \text{Perimeter} &= 0.5 + 1 + 1 + 0.5 + 1 + 1 \\ &\quad + 0.5 + 1 + 1 + 0.5 + 1 + 1 \\ &= 10 \text{ m} \end{aligned}$$



(iii) Shari's arrangement have greater perimeter.

(iv) Students have to do it by themselves.