

## Ch-17 Perimeter and Area

### Points to remember

1) Perimeter is derived from the Greek word “peri” which means **around** and “metron” means **measure**. Thus, Perimeter means distance around a plane figure or length of the boundary.

2) There are three types of perimeter;

**(a) Perimeter of Rectangle :-** A rectangle is a plane figure whose opposite sides are of equal lengths.

**Formula:-** Perimeter of rectangle =  $2 \times (l+b)$

**(b) Perimeter of Square :-** A square is a plane figure whose all the sides are equal.

**Formula:-** Perimeter of square =  $4 \times \text{side}$

**(c) Perimeter of an Equilateral Triangle :-** An equilateral triangle is a triangle whose all the three sides are equal.

**Formula:-** Perimeter of an equilateral triangle =  $3 \times \text{side}$



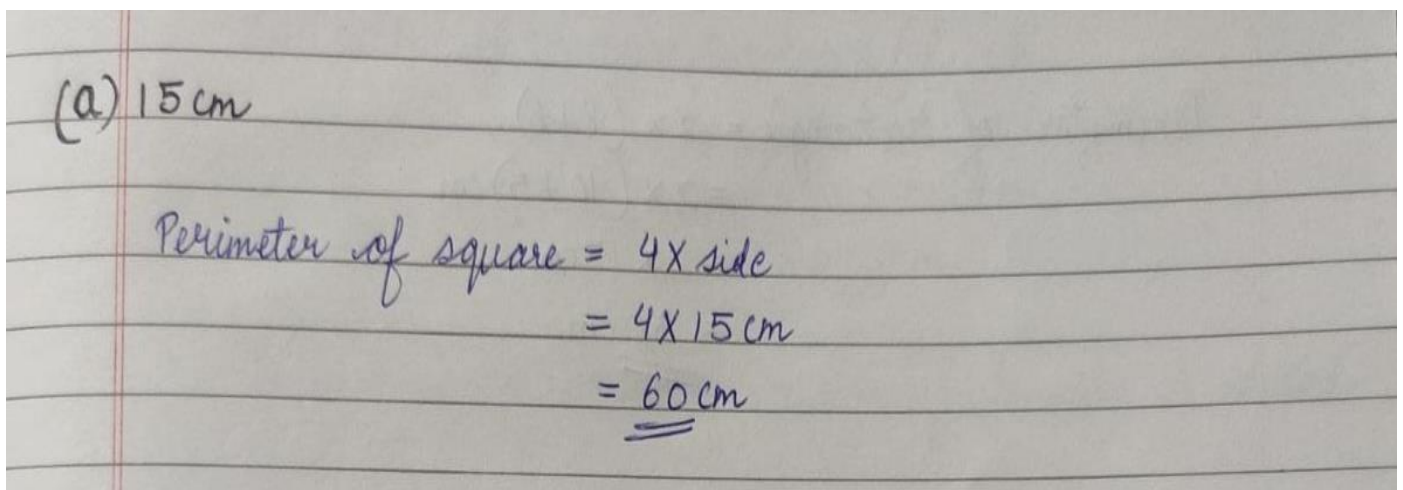
### Self Practice 17A

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1. Find the perimeter of a square with side length

- (a) 15 cm    (b) 8 mm    (c) 1.9 m    (d) 2.13 m    (e) 8.2 cm    (f) 0.14 km

**Solution 1:-**



(c) 1.9 m

$$\begin{aligned}\text{Perimeter of square} &= 4 \times \text{side} \\ &= 4 \times 1.9 \text{ m} \\ &= \underline{\underline{7.6 \text{ m}}}\end{aligned}$$

(d) 2.13 m

$$\begin{aligned}\text{Perimeter of square} &= 4 \times \text{side} \\ &= 4 \times 2.13 \text{ m} \\ &= \underline{\underline{8.52 \text{ m}}}\end{aligned}$$

**In Q1. (b), (e) and (f) are homework.**

2. Find the perimeter of a rectangle whose dimensions are given below.

	(a)	(b)	(c)	(d)	(e)	(f)
Length	10 cm	18 m	7 mm	6.4 cm	12.5 m	12.5 km
Breadth	5 cm	12 m	2.5 mm	36 mm	70 cm	3.2 km

**Solution 2:-**

(a) Length = 10 cm, breadth = 5 cm

$$\begin{aligned}\text{Perimeter of rectangle} &= 2 \times (l+b) \\ &= 2 \times (10+5) \text{ cm} \\ &= 2 \times 15 \text{ cm} \\ &= \underline{\underline{30 \text{ cm}}}\end{aligned}$$

(c) Length = 7 mm, breadth = 2.5 mm

$$\begin{aligned}\text{Perimeter of rectangle} &= 2 \times (l+b) \\ &= 2 \times (7+2.5) \text{ mm} \\ &= 2 \times 9.5 \text{ mm} \\ &= \underline{\underline{19.0 \text{ mm}}}\end{aligned}$$

(e) Length = 12.5 m , breadth = 70 cm = 0.70 m

$$\begin{aligned}\text{Perimeter of rectangle} &= 2 \times (l + b) \\ &= 2 \times (12.5 + 0.70) \text{ m} \\ &= 2 \times 13.20 \text{ m} \\ &= \underline{\underline{26.40 \text{ m}}}\end{aligned}$$

**In Q2. (b) , (d) and (f) are homework.**

3. How many metres of fencing is required to enclose a rectangular vegetable garden 6.8 m long and 5.6 m wide?

**Solution 3:-**

Length of the garden = 6.8 m  
Breadth of the garden = 5.6 m

$$\begin{aligned}\text{Perimeter of a garden} &= 2 \times (l + b) \\ &= 2 \times (6.8 + 5.6) \text{ m} \\ &= 2 \times 12.4 \text{ m} \\ &= \underline{\underline{24.8 \text{ m}}}\end{aligned}$$

$\therefore$  To enclose a garden 24.8 m of fencing is needed.

4. The length of a rectangular park is 0.140 km and its breadth is 80 m. What is the perimeter of the park in metres? Three rounds of barbed wire are needed to fence the park. Find the cost of fencing the park if the barbed wire costs ₹ 2.20 per metre.

**Solution 4:-**

$$\begin{aligned}\text{Length of the park} &= 0.140 \text{ Km} = 140 \text{ m} \\ \text{Breadth of the park} &= 80 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Perimeter of park} &= 2 \times (l+b) \\ &= 2 \times (140+80) \text{ m} \\ &= 2 \times 220 \text{ m} \\ &= \underline{\underline{440 \text{ m}}}\end{aligned}$$

$$\text{Rounds of wire to fence the park} = 3$$

$$\begin{aligned}\therefore \text{Total Perimeter of the park} &= 440 \text{ m} \times 3 \\ &= 1320 \text{ m}\end{aligned}$$

$$\begin{aligned}\text{Cost of 1 m of wire} &= ₹ 2.20 \\ \text{So, cost of 1320 m of wire} &= ₹ 2.20 \times 1320 \\ &= \underline{\underline{₹ 2904}}\end{aligned}$$

$\therefore$  The cost of fencing the park is ₹ 2904

5. How much lace will be needed to put around a square cushion of side 70 cm? What will be the cost of the lace required if the lace costs ₹ 10 per metre?

**Solution 5:-**

Side of a square cushion = 70 cm

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{Side} \\ &= 4 \times 70 \text{ cm} \\ &= 280 \text{ cm} \\ &= 2.80 \text{ m}\end{aligned}$$

Cost of 1 m of lace = ₹10

So, cost of 2.80 m of lace = ₹10 × 2.80 = ₹28

6. Complete the given table.

	(a)	(b)	(c)	(d)
Length			20 mm	
Breadth	14 m	8 cm		12 cm
Perimeter	58 m	34 cm	50 mm	40 cm

**Solution 6:-**

(a) Length = ?, Breadth = 14 m, Perimeter = 58 m

$$\begin{aligned}\text{Perimeter} &= 2 \times (l + b) \\ 58 \text{ m} &= 2 \times (l + 14 \text{ m}) \\ 58 \text{ m} &= 2l + 28 \text{ m} \\ 2l &= 58 \text{ m} - 28 \text{ m} \\ 2l &= 30 \text{ m} \\ l &= \frac{30}{2} \\ &= 15 \text{ m}\end{aligned}$$

∴ Length = 15 m.

(6) Length = 20 mm, Breadth = ? , Perimeter = 50 mm

$$\text{Perimeter} = 2 \times (l+b)$$

$$50 \text{ mm} = 2 \times (20 \text{ mm} + b)$$

$$50 \text{ mm} = 40 \text{ mm} + 2b$$

$$2b = 50 \text{ mm} - 40 \text{ mm}$$

$$2b = 10 \text{ mm}$$

$$b = \frac{10^5}{2} \text{ mm}$$

$$= \underline{\underline{5 \text{ mm}}}$$

$\therefore$  Breadth = 5 mm

**In Q6. (b) and (d) are homework.**

7. Find the length of a side of a square whose perimeter is

(a) 20.8 cm

(b) 12.6 cm

(c) 24 m

(d) 7.2 m

**Solution 7:-**

(a) 20.8 cm

$$\text{Side} = \frac{\text{Perimeter}}{4}$$

$$= \frac{20.8 \text{ cm}}{4}$$

$$= \underline{\underline{5.2 \text{ cm}}}$$

(c) 24m

$$\text{side} = \frac{\text{Perimeter}}{4}$$

$$= \frac{24}{4}$$

$$= \underline{\underline{6\text{m}}}$$

**In Q7. (b) and (d) are homework.**

8. A rope of length 40.8 m was used to fence off a square patch of land for a garden. Find the length of each side of the square garden.

**Solution 8:-**

Perimeter of square garden = 40.8 m  
side = ?

$$\text{side} = \frac{\text{Perimeter}}{4}$$

$$= \frac{40.8\text{ m}}{4}$$

$$= \underline{\underline{10.2\text{ m}}}$$

9. The perimeter of an envelope is 38 cm. If the breadth of the envelope is 5 cm, what is its length?

**Solution 9:-**

Perimeter of envelope = 38 cm  
Breadth of envelope = 5 cm  
Length of envelope = ?

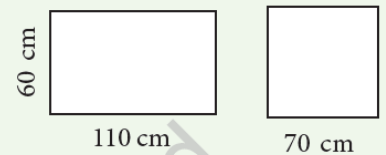
$$\begin{aligned} \text{Perimeter of envelope} &= 2 \times (l + b) \\ 38 \text{ cm} &= 2 \times (l + 5) \text{ cm} \\ 38 \text{ cm} &= 2l + 10 \text{ cm} \\ 2l &= 38 \text{ cm} - 10 \text{ cm} \\ 2l &= 28 \text{ cm} \\ l &= \frac{28}{2} \text{ cm} = 14 \text{ cm} \end{aligned}$$

$\therefore$  The length of an envelope is 14 cm.

Figure:

10. The figures given on the right show a rectangle and a square with dimensions given.

- (a) What is the perimeter of each figure?  
(b) Which figure has greater perimeter and by how much?



**Solution 10:-**

(a) Length = 110 cm, Breadth = 60 cm      Side = 70 cm

$$\begin{aligned} \text{Perimeter of rectangle} &= 2 \times (l + b) \\ &= 2 \times (110 + 60) \text{ cm} \\ &= 2 \times 170 \text{ cm} \\ &= \underline{\underline{340 \text{ cm}}} \end{aligned}$$
$$\begin{aligned} \text{Perimeter of square} &= 4 \times \text{side} \\ &= 4 \times 70 \text{ cm} \\ &= \underline{\underline{280 \text{ cm}}} \end{aligned}$$

(b) Perimeter of rectangle is greater than perimeter of square by 60 cm.

$$\begin{aligned} \text{Difference} &= 340 \text{ cm} - 280 \text{ cm} \\ &= \underline{\underline{60 \text{ cm}}} \end{aligned}$$