

Perimeter and Area



Perimeter: The perimeter of a closed figure is equal to the sum of the lengths of all its sides.

(a) Perimeter of a rectangle: The perimeter of a rectangle is the sum of all its sides. The opposite sides of a rectangle are equal.

Perimeter = Twice the length + Twice the width

Perimeter = $2(\text{length}) + 2(\text{width}) = 2(\text{length} + \text{width})$

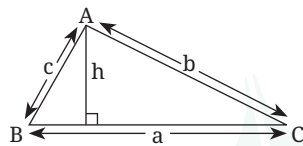
$P = 2(l + b)$ where, l = length and b = width

(b) Perimeter of a square: A square is a special rectangle whose four sides are equal. If one side of a square is 'a' unit, then we can say that both its length and width are 'a' unit.

Perimeter of square = $2(l + b) = 2(a + a) = 2 \times 2a = 4a = 4$ times the side

(c) Perimeter of a triangle:

Perimeter of a triangle = Sum of three sides = $a + b + c$



(d) Regular Polygon: All sides and all angles of a regular polygon are equal. Since all sides are equal, it is simple to find the perimeter:

Perimeter of a regular polygon = number of sides $\times$ length of a side

Perimeter = $n \times s$

Example: Equilateral Triangle: It has 3 equal sides, say each side is 6 cm.

Perimeter = $3 \times 6 = 18\text{cm}$

Area

The amount of space enclosed within a two-dimensional shape, measured in square units is called area.

(a) Area of a rectangle: For a rectangle whose length is l units and breadth is b units.

Area = $l \times b$ square units

(b) Area of a square: A square whose side is of length 'a' unit.

Area of a square = $a \times a = a^2$ square units

(c) Area of a triangle: Area of a triangle = $\frac{1}{2} \times \text{Base} \times \text{Altitude} = \frac{1}{2} \times a \times h$ sq. unit

Example: Find the perimeter and area of a rectangle whose length is 14 cm and breadth 5 cm .

Sol: Length = 14 cm

Breadth = 5 cm

So, perimeter of rectangle = $2 \times (l + b)$

= $2 \times (14 + 5) = 38 \text{ cm}$

$$\text{Area of rectangle} = l \times b = 14 \times 5 = 70 \text{ cm}^2$$

Example: Find the cost of levelling up a playground, which is 20 m long and 25 m wide, at the rate of ₹3.5 per square metre. Also find the cost of fencing at ₹1.60 per metre.

Sol: Length of the playground = 20 m

Breadth of the playground = 25 m

Area of the playground = $20 \times 25 \text{sq.m} = 500 \text{sq.m}$

Cost of levelling 1sq.m = ₹3.5

Cost of levelling 500 sq. m = $₹500 \times 3.5 = ₹1750.0$

Perimeter of the playground = $2 (\text{length} + \text{breadth}) = 2(20 + 25) \text{m} = 90 \text{ m}$

Cost of 1 m fencing = ₹1.60

Cost of 90 m fencing = $1.60 \times 90 = ₹144$