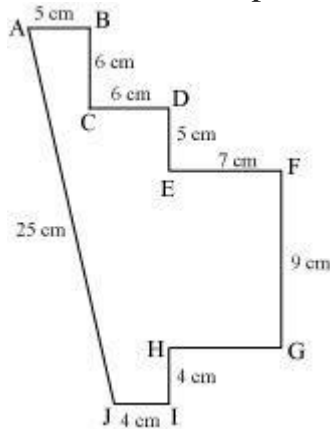# Mensuration

- The perimeter of a closed figure is the distance covered along the boundary of the figure when we go around it once. Its units are cm, m etc.

  Example: Let us find the perimeter of the following figure.

  Perimeter of ABCDEFGHIJA = AB + BC + CD + DE + EF + FG + GH + HI + IJ + JA

  $$= (5 + 6 + 6 + 5 + 7 + 9 + 7 + 4 + 4 + 25) \text{ cm}$$

  $$= 78 \text{ cm}$$

- Perimeter of a rectangle = 2 (length + breadth)

  Example:

  What is the perimeter of a rectangular field whose length and breadth are 15 m and 8 m respectively?

  Solution:

  Perimeter of rectangular field = 2 (15 m + 8 m) = (2 × 23) m = 46 m

  Perimeter of an equilateral triangle = 3 × length of a side

Perimeter of a square = 4 × length of a side
In general, perimeter of a regular closed polygon = Number of sides of the polygon × length of each side

Example:
If a farmer wants to fence a square field of length 50 m with 5 rounds of wire then what is the length of the wire required?
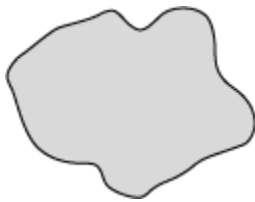
Solution:

Length of wire required = 5 × (perimeter of square field)

$$= 5 \times (4 \times \text{side})$$

$$= 5 \times [(4 \times 50)\ \text{m}]$$

$$= 1000\ \text{m}$$

- The region enclosed by a closed figure is called its **area.**

- Units of area are square cm, square m etc.
- The concept of area is widely used in our daily life. For example, to find the area of the carpet required to cover the floor, etc.
- We can estimate the area of a surface by drawing it on a square graph paper, where every square measures 1 cm × 1 cm. For this, we have to adopt the following conventions.
  o The area of 1 full square is taken as 1 square unit.
  o The area of a region which is more than half the square is taken as 1 square unit.
  o The area of half the square is taken as $\frac{1}{2}$ square unit.
  o We have to ignore the portions of area that are less than half a square.

   Example: Find the area of the following figure.
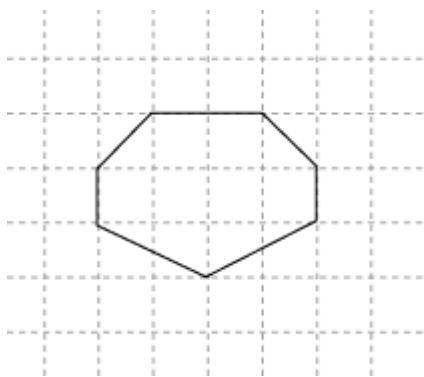
Solution: We can represent the number of full-filled squares, half filled squares etc. in a tabular form as follows:

Area covered	Number	Area estimate (square unit)
Full-filled squares	6	6
Half-filled squares	2	$\frac{1}{2} \times 2 = 1$
More than half-filled squares	2	2
Less than half-filled squares	2	0

∴ Total area = (6 + 1 + 2) square units = 9 square units

- Area of a rectangle is given by the formula:

  Area of a rectangle = length × breadth
  Example: How much carpet is required to cover a rectangular floor of length 25 m and breadth 18 m?
  Solution: Area of the carpet required = Area of rectangular floor

$$= 25 \text{ m} \times 18 \text{ m} = 450 \text{ m}^2$$

- Area of a square is given by the formula:

  Area of a square = side × side
  Example: What is the area of a square park of side 10 m 20 cm?

Solution: Length of park = 10 m 20 cm = 10.2 m

Area of park = 10.2 m × 10.2 m = 104.04 m²