Area of a Triangle

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A triangle is a closed figure with three sides and three angles. The area of a triangle is the space enclosed by its three sides. The formula to calculate the area of a triangle is: The unit of area is always in square units (e.g., cm², m², km²).

Type of Triangle	Formula for Area	Example Calculation
Any Triangle	$\frac{1}{2}$ × Base × Height	If B = 8 cm, H = 5 cm, then Area = $\frac{1}{2} \times 8 \times 5 = 20 \text{ cm}^2$
Equilateral Triangle	$\frac{\sqrt{3}}{4}$ × Side ²	If side = 6 cm, then Area = $\frac{\sqrt{3}}{4} \times 6^2$ = 15.6 cm ²

Example Calculations

Example 1:

Find the area of a triangle with base = 10 cm and height = 4 cm.

Solution:



Example 2:

A triangular field has an area of 50 m² and a base of 10 m. Find its height.

Solution:

Area =
$$\frac{1}{2}$$
 × Base × Height
50 = $\frac{1}{2}$ × 10 × Height
Height = (50 × 2) ÷ 10 = 10 m



Example 3:

Find the area of an equilateral triangle with a side length of 8 cm.

Solution:

Area =
$$\frac{\sqrt{3}}{4} \times \text{Side}^2$$

= $\frac{\sqrt{3}}{4} \times 8^2$
= $\frac{\sqrt{3}}{4} \times 64$

= 27.7 cm² (approx.)

Properties of the Area of a Triangle

- i. The area of a triangle is always positive as it represents a physical space.
- ii. If the base or height increases, the area increases.
- iii. Doubling the base or height doubles the area, but doubling both makes the area four times larger.
- iv. A triangle with the same base and height as a rectangle has half the area of the rectangle.
- v. The area of an equilateral triangle is calculated differently using the formula $\frac{\sqrt{3}}{4} \times$ Side².
- vi. The unit of area is always a square unit (e.g., cm², m², km²).