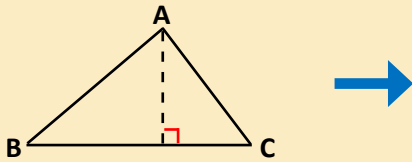


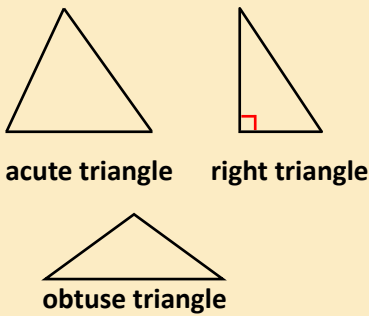
Triangles

A triangle has three sides and three angles.



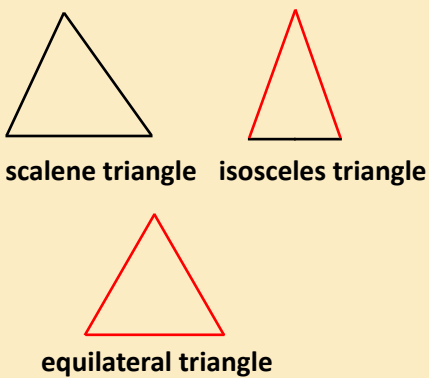
- **Base:** any side of the triangle
- **Height:** a line segment perpendicular to the base from the opposite vertex

Classification of triangles by their angles:



- An **acute triangle** has three acute angles (an acute angle measures less than 90°)
- A **right triangle** has one 90° angle
- An **obtuse triangle** has an obtuse angle (an obtuse angle has more than 90°)

Classification of triangles by their sides:



- **Equilateral triangle:** three equal sides, three equal angles
- **Isosceles triangle:** two equal sides, two equal angles
- **Scalene triangle:** no equal sides, no equal angles

Triangle properties:

- Angles on the inside sum up to 180° .
- The sum of the lengths of any 2 sides of a triangle must be greater than the third side.
- The largest interior angle and the longest side are opposite each other.



Example 1

Can you use side lengths of 5 cm, 3 cm and 6 cm to form a triangle?

Explanation

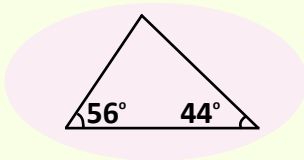
The sum of the lengths of any 2 sides of a triangle must be greater than the third side.

$$\begin{cases} 5 + 3 > 6 \\ 5 + 6 > 3 \\ 6 + 3 > 5 \end{cases}$$

Therefore we can use side lengths of 5 cm, 3 cm and 6 cm to form a triangle.

Example 2

What is the measure of the unknown angle in this triangle?



Explanation

Since angles on the inside sum up to 180°,

$$\begin{aligned} \text{The unknown angle} &= 180^\circ - 56^\circ - 44^\circ \\ &= 180^\circ - (56^\circ + 44^\circ) \\ &= 180^\circ - 100^\circ \\ &= 80^\circ \end{aligned}$$

Therefore the unknown angle is 80°.

Example 3

An isosceles triangle has a vertex angle of 120°. What is the measure of the base angle?

Explanation

Since an isosceles triangle has two equal angles and all angles sum up to 180°.

The sum of two base angles is $180^\circ - 120^\circ = 60^\circ$.

Therefore the base angle of the triangle is $60^\circ \div 2 = 30^\circ$.