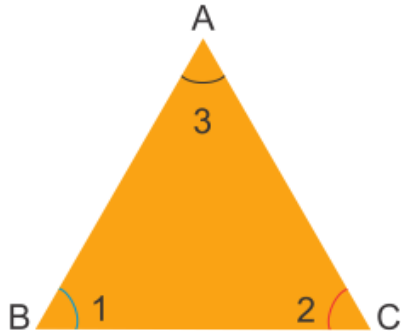


TRIANGLES

Properties of Triangles



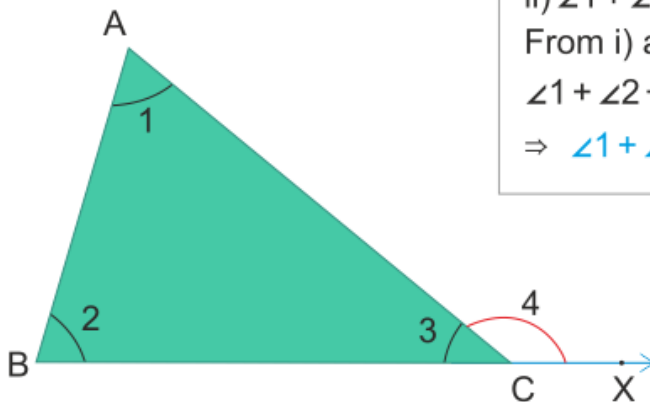
- The **sum of the interior angles** of a triangle is **180°** . $\angle 1 + \angle 2 + \angle 3 = 180^\circ$
- The Sum of any two sides of a triangle is always greater than its third side.
 $AB + BC > AC$
- In a triangle, the angle opposite to the longest side is the largest angle

Exterior Angle Property of a Triangle

If a side of a triangle is stretched, the exterior angle so formed is equal to the sum of two opposite interior angles.

Proof:

i) $\angle 3 + \angle 4 = 180^\circ$ (Linear pair)
ii) $\angle 1 + \angle 2 + \angle 3 = 180^\circ$ (Angle sum property)
From i) and ii) we get,
 $\angle 1 + \angle 2 + \angle 3 = \angle 3 + \angle 4$
 $\Rightarrow \angle 1 + \angle 2 = \angle 4$



Types of Triangles

Triangles Based on Sides

Scalene	Isosceles	Equilateral
		
Length of all sides are different	Length of two sides are equal	Length of all sides are equal

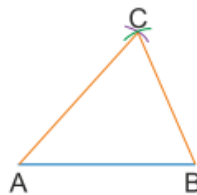
Triangles Based on Angles

Acute	Right	Obtuse
		
Each angle is $< 90^\circ$	One angle is $= 90^\circ$	One angle is $> 90^\circ$

Construction of Triangles

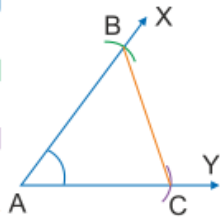
SSS Triangle: Given AB, AC and BC

- i Draw line segment AB
- ii With B as centre and radius = BC draw an arc
- iii With A as centre and radius = AC draw an arc intersecting the arc in step (ii)
- iv Join CA and CB to obtain $\triangle ABC$



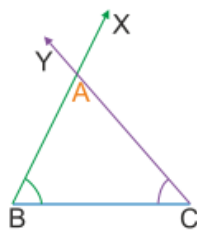
SAS Triangle: Given AB, AC and $\angle A$

- i Draw ray AY
- ii Draw $\angle XAY = \angle A$ using protractor
- iii With A as centre and radius = AB cut AX at B
- iv With A as centre and radius = AC cut AY at C
- v Join BC to obtain $\triangle ABC$



ASA Triangle: Given $\angle B$ and $\angle C$ and BC

- i Draw line segment BC
- ii Draw $\angle CBX = \angle B$ using protractor
- iii Draw $\angle BCY = \angle C$ using protractor, such that Y is on same side of BC as X
- iv The point where BX and CY intersect is A, thus we obtain $\triangle ABC$



RHS Triangle: Given $\angle C = 90^\circ$, hypotenuse AB and BC

- i Draw line segment BC
- ii Draw $\angle BCX = 90^\circ$ using protractor
- iii With B as centre and radius = AB cut CX at A
- iv Join BA to obtain $\triangle ABC$

