Exterior Angle of a Triangle

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

Given: In the given figure, the side BC of ΔABC is extended.

To prove: The exterior angle ∠ACX so formed is the sum of measures of ∠ABC and ∠CAB.

Proof: ∠3 and ∠4 form a linear pair since they represent the adjacent angles on a straight line.

Thus, ∠3 + ∠4 = 180° …….(2)

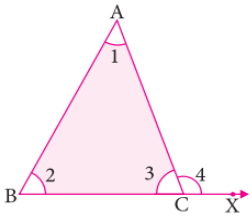
Also, from the angle sum property, it follows that:

∠3 + ∠1 + ∠2 = 180°…….(3)

From equation (2) and (3) it follows that:

∠4 = ∠1 + ∠2

Hence, ∠ACX = ∠BAC + ∠CBA



Let us understand with an example:

Example: In the figure, two of the angles have measures 60° and 70°. Find the measures of ∠XYT.

Solution: In ΔXYZ, ∠XYT is an exterior angle at Y.

So, ∠XYT = ∠YXZ + ∠XZY

= 60° + 70° = 130°

Thus, ∠XYT = 130°