

Section 7.1 – Angle Relationships in Triangles

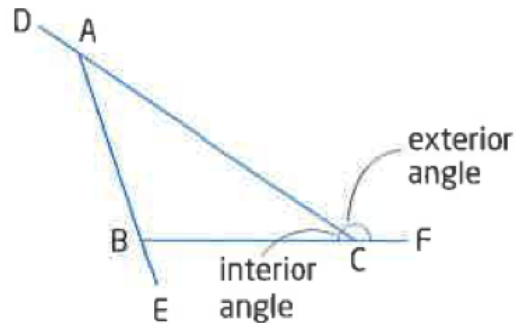
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Jensen

Interior and Exterior Angles

Interior Angle - angle formed on the inside of a polygon by two sides meeting at a vertex.

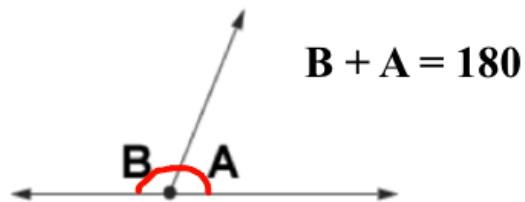
Exterior Angle - angle formed on the outside of a geometric shape by extending one of the sides past a vertex.



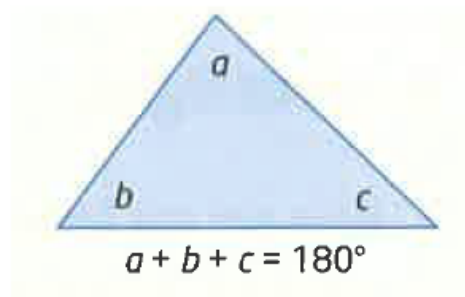
You Must Remember...

Supplementary Angles:

- angles that add to 180 degrees
- angles on a straight line are supplementary

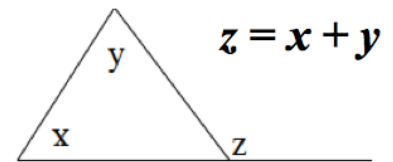


The sum of the **interior angles** of a triangle is **180** degrees.

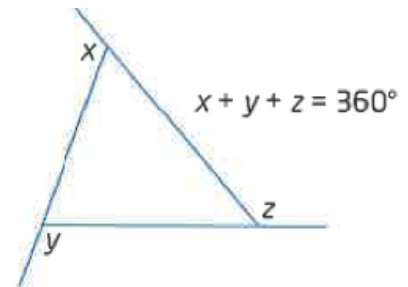


New Exterior Angle Rules...

The **exterior angle** is equal to the sum of the 2 opposite interior angles.



The sum of the **exterior angles** of a triangle is 360 degrees.



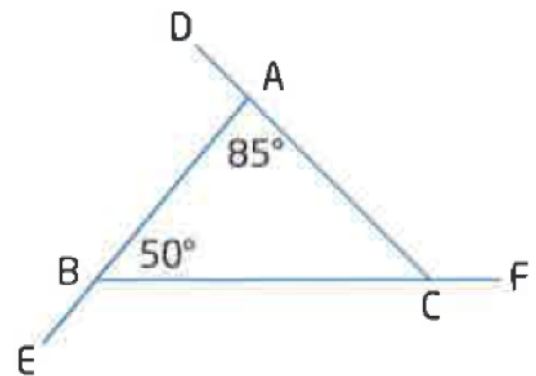
Example 1: Find the measures of the exterior angles in $\triangle ABC$

Note: at vertex A and B, the interior and exterior angles are supplementary angles (form an angle of 180 degrees)

$\angle DAB$:

$\angle EBC$:

$\angle ACF$:



Method 1: Since the exterior angle at a vertex of a triangle is equal to the sum of the interior angles at the other two vertices...

Method 2: Since the sum of the exterior angles of a triangle is 360 degrees...

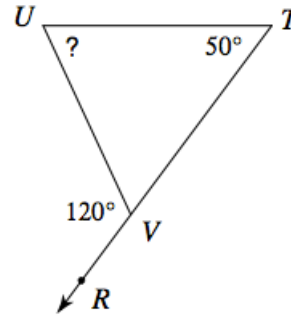
The measures of the three exterior angles are:

$\angle DAB =$

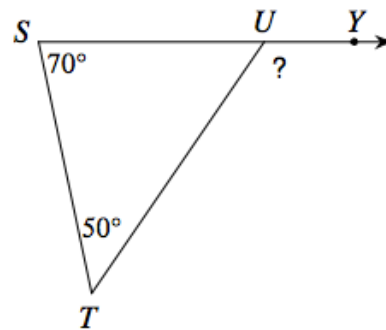
$\angle EBC =$

$\angle ACF =$

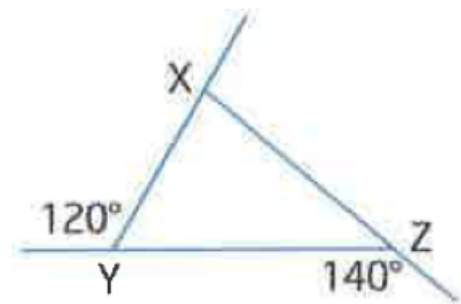
Example 2: Find the measure of the indicated angle



Example 3: Find the measure of the indicated angle



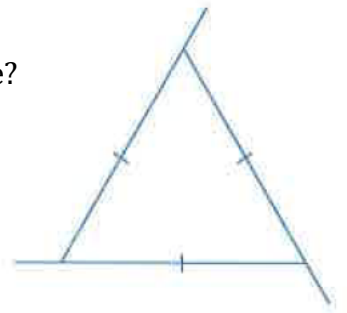
Example 4: Find the measure of the exterior angle at vertex X



Example 5: What is the measure of each exterior angle of an equilateral triangle?

All angles in an equilateral triangle are _____.

Therefore all three interior angles are...



At each vertex, the interior angle and exterior angle are supplementary, meaning they sum to _____.

Therefore all three exterior angles are...