

11.2 Angle Theorems for Triangles

Essential Question: What can you conclude about the measure of the angles of a triangle?

Learning Goal: Students will be able to use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. MAFS.8.G.1.5, MAFS.8.EE.3.7, and MAFS.8.EE.3.7b

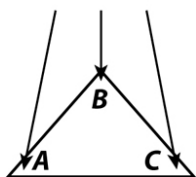
Questions:

Notes:

Exterior Angles and Remote Interior Angles

An **interior angle** of a triangle is formed by two sides of the triangle. An **exterior angle** is formed by one side of the triangle and the extension of an adjacent side. Each exterior angle has two remote interior angles. A **remote interior angle** is an interior angle that is not adjacent to the exterior angle. **The sum of the measures of the interior angles of a triangle is always 180° .**

interior angles



The three **interior angles** of a triangle always have a sum of 180° . Write an equation to find an unknown interior angle in a triangle.

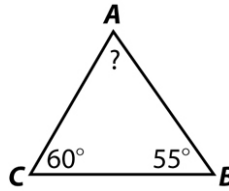
$$m\angle A + m\angle B + m\angle C = 180^\circ$$

Finding Missing Angle Measures in Triangles

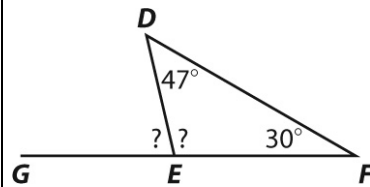
If you know the measure of two angles in a triangle, you can subtract their sum from 180° . The difference is the measure of the third angle.

The two known angles are 60° and 55° .

$$60^\circ + 55^\circ = 115^\circ$$



$$180^\circ - 115^\circ = 65^\circ$$



$\angle DEG$ is an **exterior angle**.

The measure of $\angle DEG$ is equal to the sum of $\angle D$ and $\angle F$.

$$47^\circ + 30^\circ = 77^\circ$$

You can find the measure of $\angle DEF$ by subtracting 77° from 180° .

$$180^\circ - 77^\circ = 103^\circ$$

The measure of $\angle DEF$ is 103° .