

Dear Family,

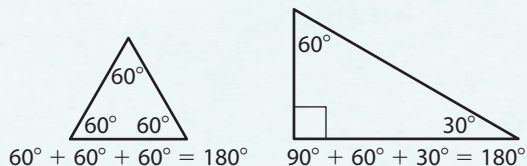
Your child is learning about angle relationships in triangles.



Triangles have many applications in everyday life.

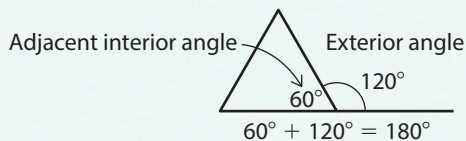
- A triangular shape can withstand weight and is often used to support rectangular structures such as tables to add strength.
- GPS (Global Positioning System) devices use the geometry of triangles to identify the exact location of the device.

The angles inside a triangle are called *interior angles*. The sum of the interior angles of a triangle is 180° .



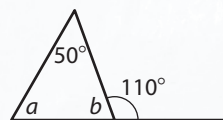
An *exterior angle* is formed by extending one of the sides of a triangle.

- An exterior angle is adjacent to an interior angle, and the sum of their measures is 180° .
- The measure of an exterior angle is also equal to the sum of the measures of the two non-adjacent interior angles.



Consider the following example:

In the diagram, the triangle has one interior angle with measure 50° and an exterior angle with measure 110° . What is a ?

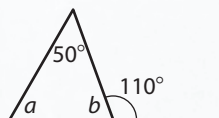


On the next page you will see two ways your child might find a .



Understand Angle Relationships in Triangles: Sample Solution

In the diagram, the triangle has one interior angle with measure 50° and an exterior angle with measure 110° . What is a ?



One way: Use the exterior angle and the adjacent interior angle.

The measures of the exterior angle and $\angle b$ have a sum of 180° , so you can write an equation to solve for b .

$$\begin{aligned}b + 110^\circ &= 180^\circ \\b &= 70^\circ\end{aligned}$$

Now you know the measures of two interior angles and you know the sum of the angles of a triangle is 180° . Write an equation to solve for a .

$$\begin{aligned}a + 50^\circ + b &= 180^\circ \\a + 50^\circ + 70^\circ &= 180^\circ \\a + 120^\circ &= 180^\circ \\a &= 60^\circ\end{aligned}$$



Another way: Use the exterior angle and the non-adjacent interior angles.

The exterior angle is equal to the sum of the two non-adjacent angles—in this case, a and the 50° angle. Write an equation to solve for a .

$$\begin{aligned}a + 50^\circ &= 110^\circ \\a &= 60^\circ\end{aligned}$$

Answer: Both methods show that $a = 60^\circ$.

Vocabulary

exterior angle an angle formed by one side of a simple, closed polygon and a line extended from an adjacent side.

