Edgenuity

Warm-Up | Finding Unknown Angle Measures

Lesson Question

Lesson Goals

Solve problems for missing angle measures in figures.

Find unknown angle measures in _____.

Find unknown angle measures in _____ figures.

Words to Know

Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.

____ vertical angles	A. adjacent angles that form a line
____ linear pair	B. the angles formed by each pair of adjacent sides on the inside of a polygon
____ interior angles	C. opposite congruent angles formed by two intersecting lines
____ adjacent angles	D. an angle formed by a side of a triangle and an extension of an adjacent side
____ exterior angle	E. angles that share a common ray and a common vertex but do not overlap

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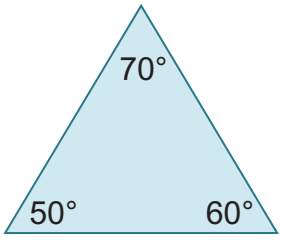
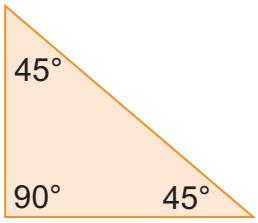
Slide 2

Analyzing Triangles

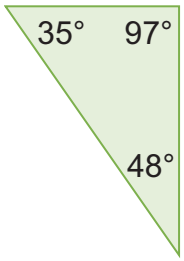
Triangles are basic geometric figures that have ☐ **interior angles** and three sides.





$70 + 50 + \square = 180$

$45 + \square + 90 = 180$



$35 + 97 + 48 = \square$

In a triangle, the sum of the interior angles is always going to be 180 degrees.

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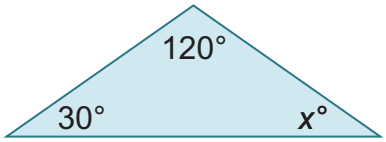
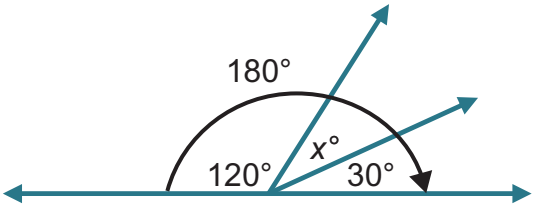
Slide 2

Angles in a Triangle

Adjacent angles are angles that share a common [ ] and ray.





$120 + x + 3 =$ [ ]

$120 +$ [ ] $+ 30 = 180$

$150 + x = 180$

$-150 \quad -150$

$x =$ [ ]

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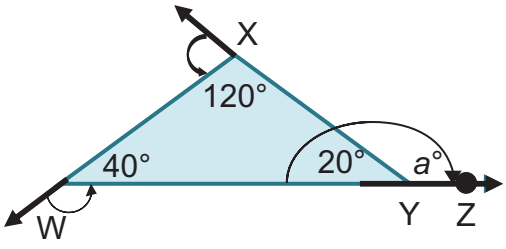
Identifying an Exterior Angle

An **exterior angle** of a triangle is the [ ] angle formed by extending one side.



The [ ] and adjacent exterior angles of a triangle form a **linear pair**.

$a + 20 =$ [ ]

$- 20 \quad - 20$

$a =$ [ ]

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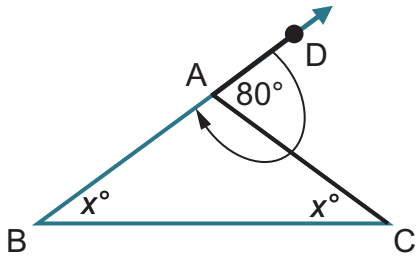
Solving for Multiple Angles

Consider triangle ABC with exterior angle ∠DAC. Find the value of x.



1. Find the measure of the interior angle using the angle measure of the exterior angle.

$$m\angle CAB + 80 = \square$$
$$-80 \quad -80$$
$$m\angle CAB = \square$$

2. Find the sum of all the interior angles of the triangle.

$$100 + x = x = 180$$
$$100 + \square = 180$$
$$2x = 80$$
$$\frac{2x}{2} = \frac{\square}{2}$$
$$x = \square$$

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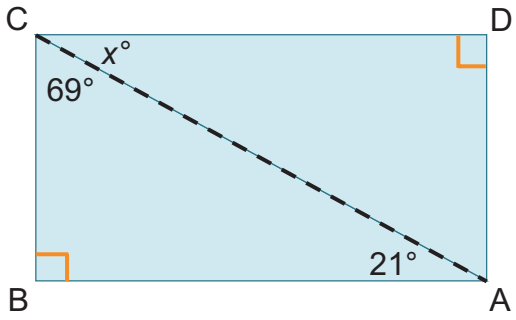
Triangles in Rectangles

Consider the rectangle ABCD with diagonal AC.



What is the value of x?

1. Determine the angle relationships and write an equation to model them.

$$21 + \square + m\angle BCA = 180$$

2. Solve the equation.

$$111 + m\angle BCA = \square$$
$$-111 \qquad -111$$
$$m\angle BCA = \square$$
$$\angle BCA + \angle ACD = \square$$
$$69 + \angle ACD = 90$$
$$-69 \qquad -69$$
$$\angle ACD = \square$$
$$x = 21$$

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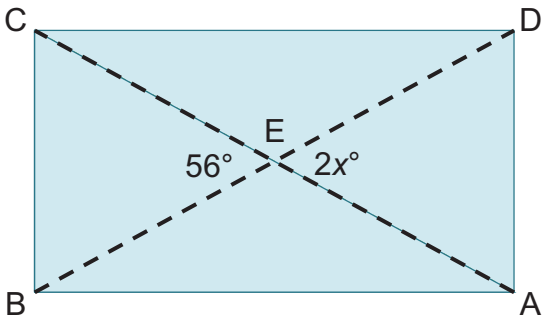
Intersecting Diagonals in a Rectangle

Vertical angles are [ ], congruent angles formed by [ ] lines.



What is the value of x?

1. Determine the angle relationships and write an equation to model them.

$$56 = \square$$

2. Solve the equation.

$$\frac{\square}{2} = \frac{2x}{2}$$

$$\square = x$$

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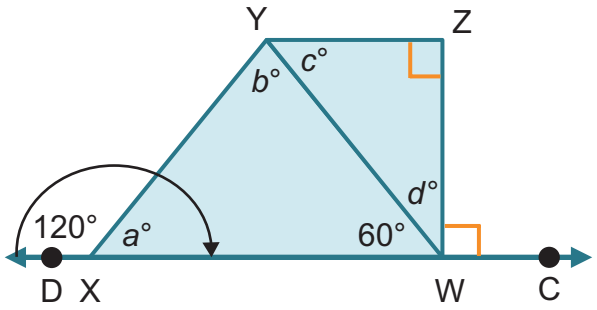
Model Solving a Multi-Step Problem

Apply what you know about angles to find the values of a and b in the figure.



$120 + a =$ ☐

$-120 \qquad -120$

$a =$ ☐

$60 + 60 + b = 180$

☐ $+ b = 180$

$-120 \qquad -120$

$b =$ ☐

Summary | Finding Unknown Angle Measures

Lesson Question	How can you use angle relationships to find unknown measures in a figure?

Answer

Use this space to write any questions or thoughts about this lesson.