Lesson 3.2:

Angles of Triangles

Essential Question

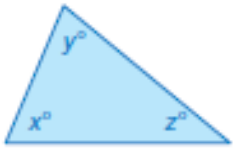
How can you describe the relationships among the angles of a triangle?

Key Idea

Interior Angle Measures of a Triangle

Words The sum of the interior angle measures of a triangle is 180°.

Algebra $x + y + z = 180$



Find the value of *x*.

a.

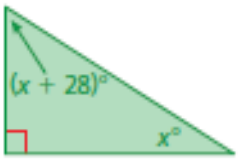
$32 + 48 + x = 180$

$80 + x = 180$

$-80 \quad -80$

$x = 100°$

b.



$90 + x + 28 + x = 180$

$118 + 2x = 180$

$-118 \quad -118$

$\frac{2x}{2} = \frac{62}{2}$

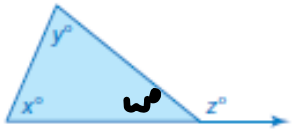
$x = 31°$

Key Idea

Exterior Angle Measures of a Triangle

Words The measure of an exterior angle of a triangle is equal to the sum of the measures of the two nonadjacent interior angles.

Algebra $z = x + y$

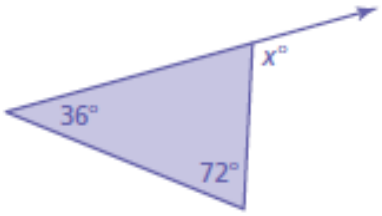


$x + y + w = 180$ Sum of triangle's angle measures

$z + w = 180$ Supplementary angles

Find the measure of the exterior angle.

a.



$36 + 72 = 108$

b.

$80 + a - 5 = 2a$

$-a \quad -a$

$80 - 5 = a$

$75° = a$

An airplane leaves from Miami and travels around the Bermuda Triangle. What is the value of *x*?

Ⓐ 26.8 Ⓑ 27.2 ● 54 Ⓓ 64

$x + 2x - 44.8 + 62.8 = 180$

$3x + 18 = 180$

$-18 \quad -18$

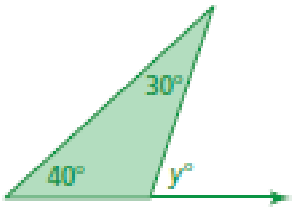
$\frac{3x}{3} = \frac{162}{3}$

$x = 54$

$62.8 - 44.8 = 18.0$

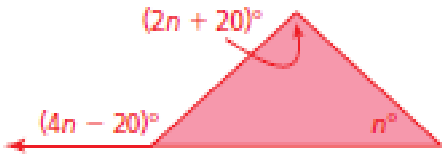
Find the measure of the exterior angle.

3.



$30° + 40° = 70°$

4.



$2n + 20 + n = 4n - 20$

$3n + 20 = 4n - 20$

$-3n \quad -3n$

$20 = n - 20$

$+20 \quad +20$

$40 = n$