Geometry

4.1 Apply Triangle Sum Property

# Classify Triangles by sides

perpendicular

triangle

Scalene

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

triangle

Equilateral

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

No congruent sides All congruent sides

Isosceles

triangle

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Two congruent sides

# Classify Triangles by Angles

triangle

Right

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

1 right angle

triangle

Equiangular

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_

triangle

Acute

\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ All congruent angles

3 acute angles

triangle

Obtuse

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1 obtuse angle

Classify the following triangle by sides and angles

Scalene, Acute

Isosceles, Right

ΔABC has vertices A(0, 0), B(3, 3), and C(-3, 3). Classify it by is sides. Then determine if it is a right triangle.

Find length of sides using distance formula

AB = √((3 – 0)2 + (3 – 0)2) = √(9 + 9) = √18 ≈ 4.24

BC = √((-3 – 3)2 + (3 – 3)2) = √((-6)2 + 0) = √(36) = 6

AC = √((-3 – 0)2 + (3 – 0)2) = √(9 + 9) = √18 ≈ 4.24

Isosceles

Check slopes to find right angles (perpendicular)

mAB = (3 – 0)/(3 – 0) = 1

mBC = (3 – 3)/(-3 – 3) = 0

mAC = (3 – 0)/(-3 – 0) = -1

AB ⊥ AC so it is a right triangle

# Triangle Sum

* Take a triangle and tear off two of the angles.
* Move the angles to the 3rd angle.
* What shape do all three angles form?

Straight line

## Triangle Sum Theorem

180°

measures

sum

A

B

C

The \_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_ of the interior angles of a triangle is \_\_\_\_\_\_\_\_.

m∠A + m∠B + m∠C = 180°

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Exterior Angle Theorem

A

B

C

1

equals

exterior

The measure of an \_\_\_\_\_\_\_\_\_\_\_\_\_ angle of a triangle \_\_\_\_\_\_\_\_\_

Two nonadjacent interior angles

sum

the \_\_\_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

m∠1 = m∠A + m∠B

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Corollary to the Triangle Sum Theorem

complementary

right

Acute angles

A

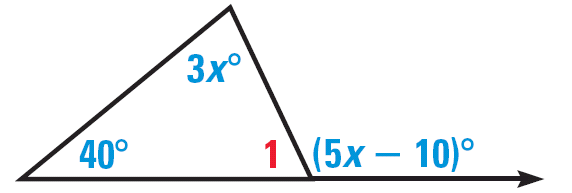
C

B

The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a \_\_\_\_\_\_\_\_\_\_ triangle are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

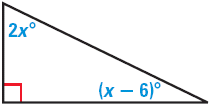
m∠A + m∠B = 90°

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Find the measure of ∠1 in the diagram.

40 + 3x = 5x – 10 🡪 50 = 2x 🡪 x = 25

m∠1 + 40 + 3x = 180 🡪 m∠1 + 40 + 3(25) = 180 🡪 m∠1 + 40 + 75 = 180 🡪 m∠1 = 65

Find the measures of the acute angles in the diagram.

2x + x – 6 = 90 🡪 3x = 96 🡪 x = 32

Top angle: 2x 🡪 2(32) = 64

Angle at right: x - 6 🡪 32 - 6 = 26

Assignment: 221 #2-36 even, 42-50 even, 54-62 even = 28 total