In $\triangle ABC$, $\overline{BD}$ bisects $\angle ABC$, and $\overline{AE}$ bisects $\angle BAC$.

A

D

1 **2**

B

E

C
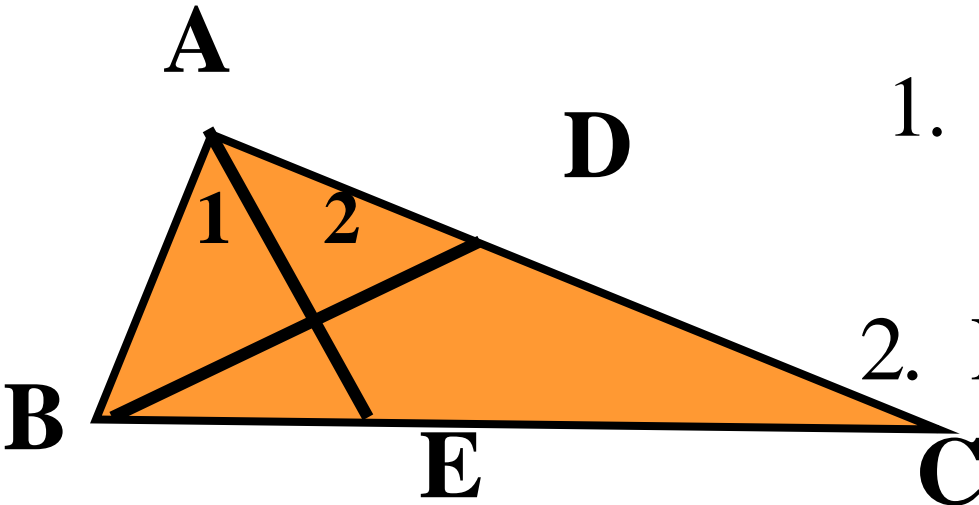
1. If $m\angle 2 = 40$, what is $m\angle 1$.

40

2. Find $m\angle BAC$ if $m\angle 2 = 27$.

54

Y

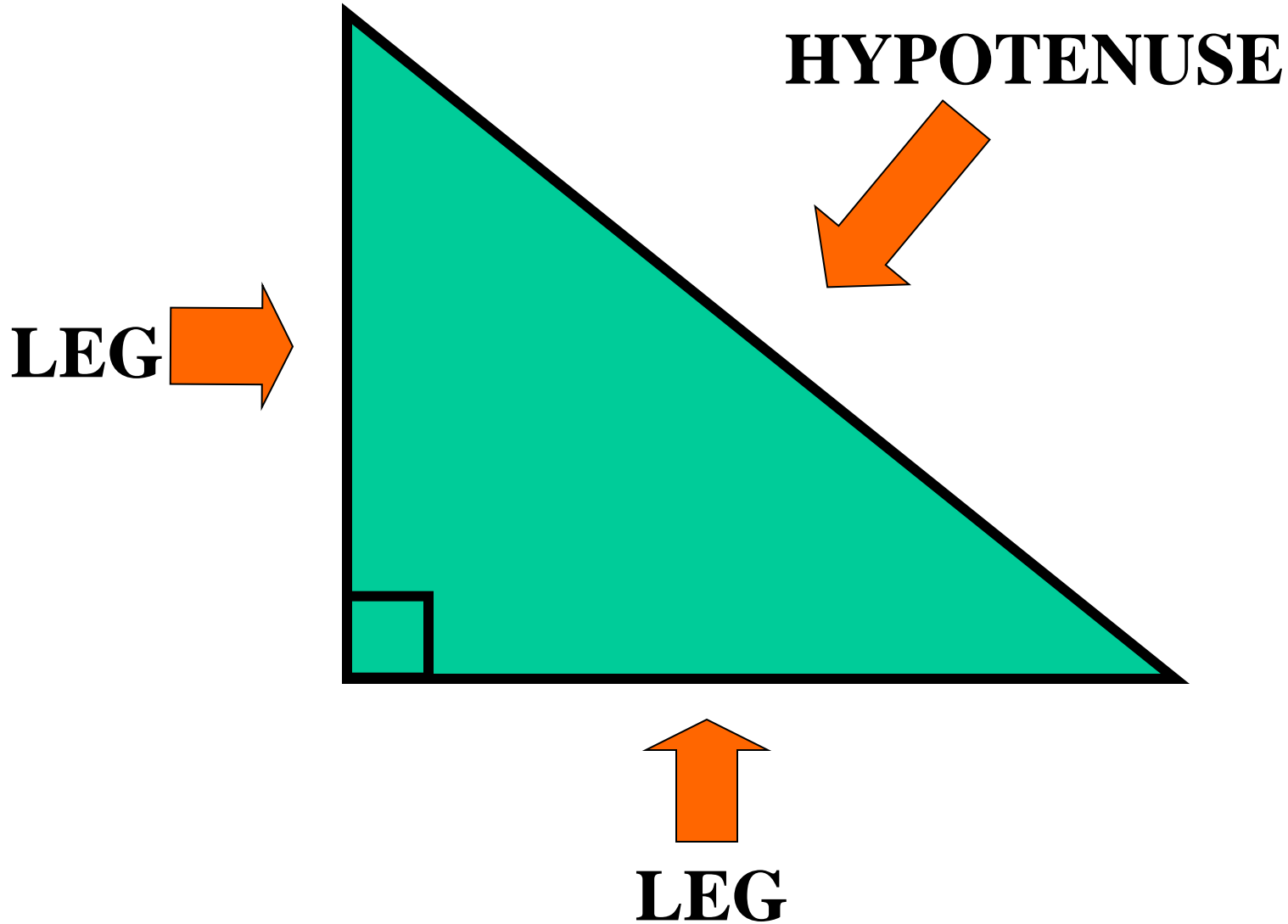3. Which angles in $\triangle XYZ$ are congruent

Y and Z

X

Z
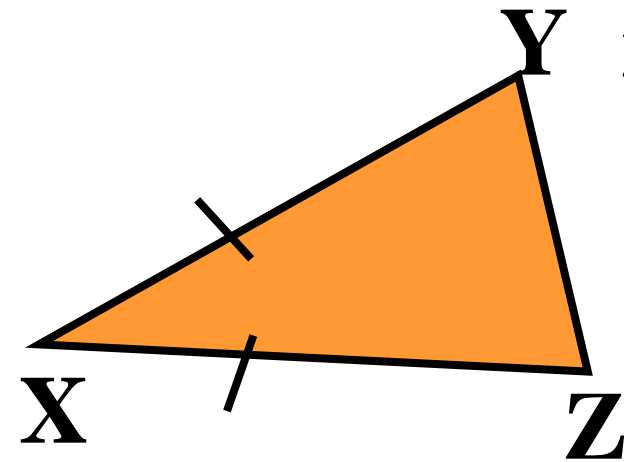
4. If $m\angle Y = 8x - 15$ and
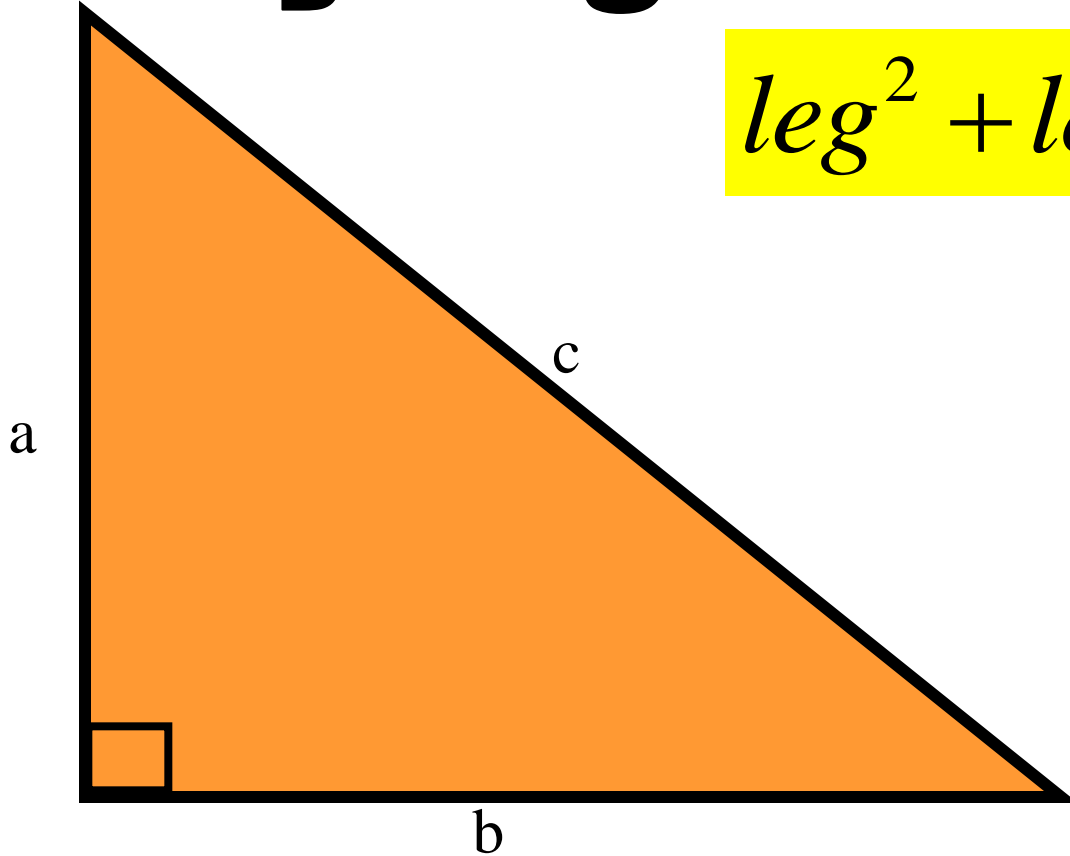
$m\angle Z = 5x + 18$, find $m\angle Y$.

73

Right Triangles

PYTHA-GORE-AN THEOREM

Pythagorean Theorem

$$leg^2 + leg^2 = hypotenuse^2$$

a

c

b

The square of the hypotenuse is equal to the sum of the square of the other two sides.

ONLY FOR RIGHT TRIANGLES
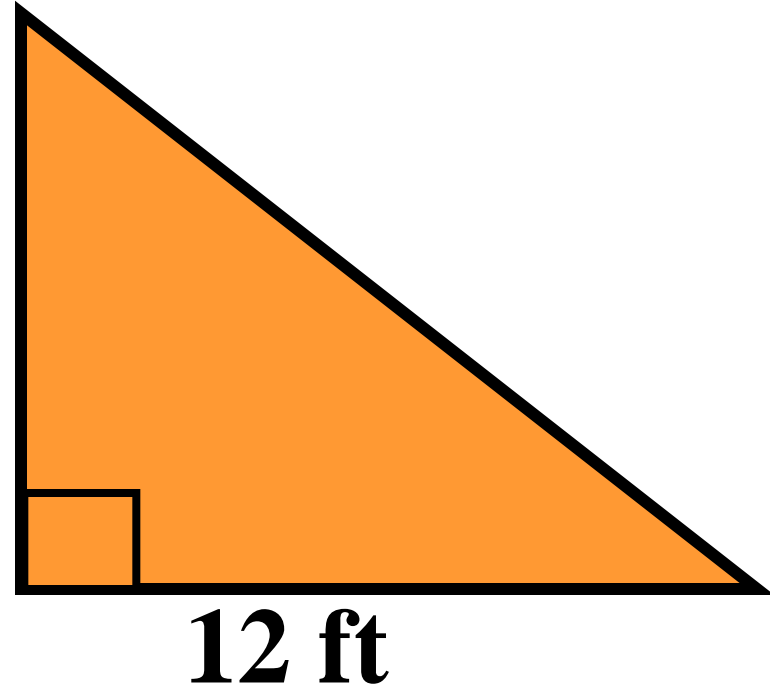
6-6 Pythagorean Theorem

$$16^2 + 12^2 = hypotenuse^2$$

$$256 + 144 = hypotenuse^2$$

$$400 = hypotenuse^2$$

$$\sqrt{400} = \sqrt{hypotenuse^2}$$

$$20\,ft = hypotenuse$$

16 ft

12 ft

Round to the nearest tenth

$$3^2 + \text{leg}^2 = 4^2$$

$$9 + leg^2 = 16$$

$$leg^2 = 7$$

$$\sqrt{leg^2} = \sqrt{7}$$

$$leg = 2.6 \ m$$

4 m

3m
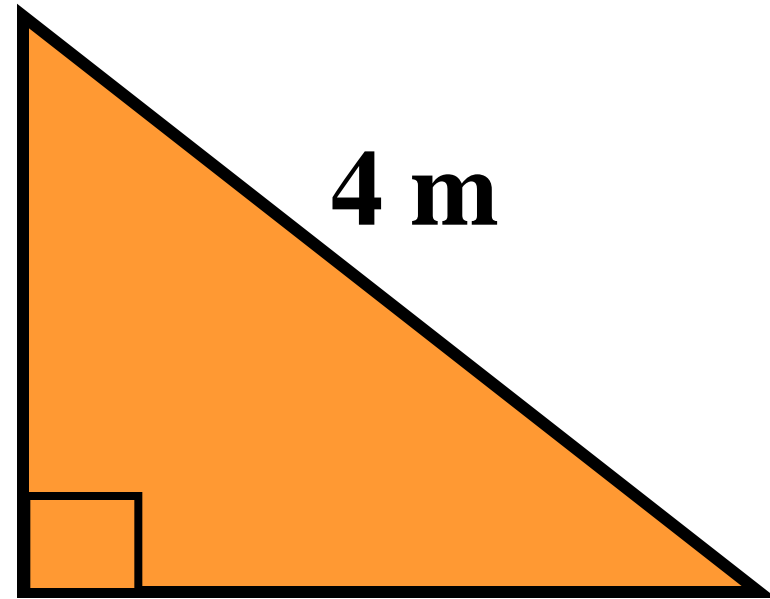
If c is the measure of the hypotenuse, find each missing measure. Round to the nearest tenth, if necessary.

1. $a = 7, b = ?, c = 25$

$$7^2 + b^2 = 25^2$$
$$b^2 = 25^2 - 7^2$$
$$b = \sqrt{(25^2 - 7^2)}$$

$$b = 24$$

2. $a = ?, b = 10, c = 20$

$$a^2 + 10^2 = 20^2$$
$$a^2 = 20^2 - 10^2$$
$$a = \sqrt{(20^2 - 10^2)}$$

$$a = 17.3$$

The measures of 3 sides for a triangle are given. Determine whether each triangle is a right triangle.

1. 20, 21, 28

$$20^2 + 21^2 \overset{?}{=} 28^2$$

2. 10, 24, 26

$$10^2 + 24^2 \overset{?}{=} 26^2$$

Check for a² + b² = c²

The legs are always the 2 smaller sides.

no

yes