

# Triangle Relationships TEKS 8.9.A, G.5.D, G.8.C

The sum of the angle measures of any triangle is  $180^\circ$ .

## EXAMPLE Find the value of $x$ .



$$60 + 35 + x = 180$$

The sum of the angle measures is  $180^\circ$ .

$$95 + x = 180$$

Simplify.

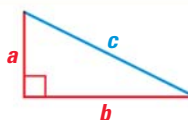
$$x = 85$$

Solve for  $x$ .

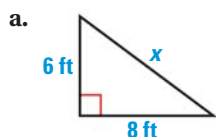
In a right triangle, the **hypotenuse** is the side opposite the right angle. The **legs** are the sides that form the right angle. The **Pythagorean theorem** states that the sum of the squares of the lengths of the legs equals the square of the length of the hypotenuse.

### Pythagorean Theorem

$$a^2 + b^2 = c^2$$



## EXAMPLE Find the value of $x$ .



$$6^2 + 8^2 = x^2$$

Pythagorean theorem

$$36 + 64 = x^2$$

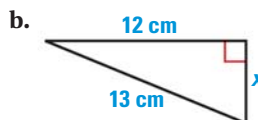
Simplify.

$$100 = x^2$$

Simplify.

$$x = 10 \text{ ft}$$

Solve for  $x$ .



$$x^2 + 12^2 = 13^2$$

Pythagorean theorem

$$x^2 + 144 = 169$$

Simplify.

$$x^2 = 25$$

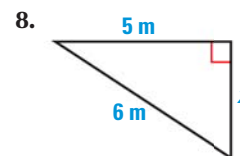
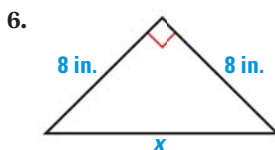
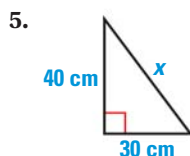
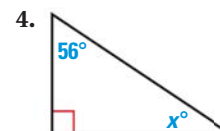
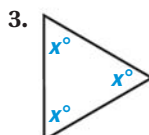
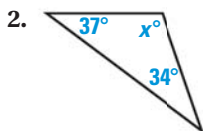
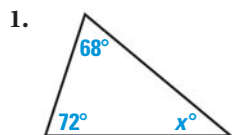
Solve for  $x^2$ .

$$x = 5 \text{ cm}$$

Solve for  $x$ .

## PRACTICE

Find the value of  $x$ .



9. A triangle with angles that measure  $x^\circ$ ,  $x^\circ$ , and  $70^\circ$