Name:

## Vocabulary and Symbols

*Describe the following geometry words in your own words. Draw the symbol if there is one associated with it.*

**Triangle:**

**Right Triangle:**

**Legs of a Triangle:**

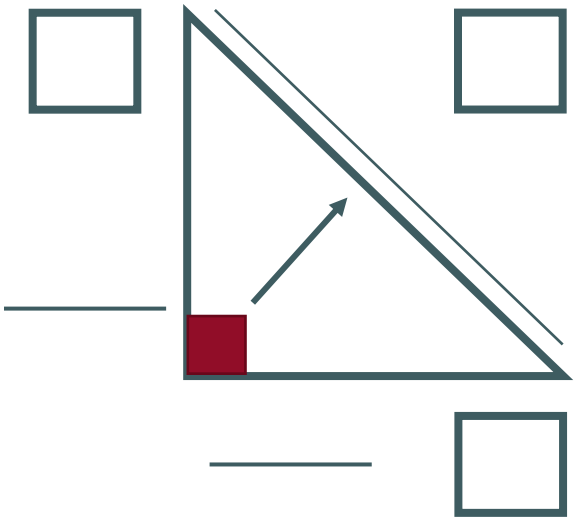
**Hypotenuse of a Triangle:**

**Angle:**

**Square Root:**

# Pythagorean Theorem

*On the lines below, record the vocabulary terms for each side. Then, using a, b, and c, label each side of the triangle in the boxes below.*



**REFLECT:**
What is the relationship among $a^2, b^2, and\ c^2$?

**CREATE:**
Using $a^2, b^2, and\ c^2$, write an equation to describe the mathematical relationship for Pythagorean theorem.

## Am I Right?

*Determine whether each of the following problems below are right triangles using the Pythagorean rule.*

1. Do these three sides construct a right triangle?

   $a$ = 6 ft  $a^2$ = _____
   $b$ = 8 ft  $b^2$ = _____
   $c$ = 10 ft  $c^2$ = _____

2. Do these three lengths form a right triangle?

   $a$ = 7 cm  $a^2$ = _____
   $b$ = 8 cm  $b^2$ = _____
   $c$ = 12 cm  $c^2$ = _____

3. Do these three sides create a right triangle?

   $a$ = 5 in  $a^2$ = _____
   $b$ = 12 in  $b^2$ = _____
   $c$ = 13 in  $c^2$ = _____

4. Do these three lengths make a right triangle?

   $a$ = 9 m  $a^2$ = _____
   $b$ = 12 m  $b^2$ = _____
   $c$ = 15 m  $c^2$ = _____

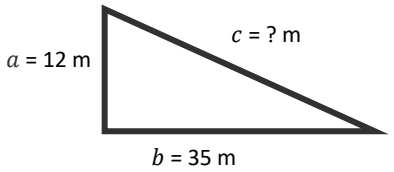
**WRITE, PAIR, SHARE:**
What does it mean when $a^2 + b^2 \neq c^2$?

**TURN & TALK:**
*What relationships do you notice between the side lengths of the Cheez-Its® triangle and questions 1 and 4?*

## What's My Hypotenuse?

*Use a calculator and the formula to find the length of each missing hypotenuse.*

5. $c^2$ = _____




Set up the equation: $a^2 + b^2 = c^2$

If $a$ = 12 m, $a^2$ = _____

If $b$ = 35 m, $b^2$ = _____

Now, $a^2 + b^2$ = _____

So, $c^2$ = _____

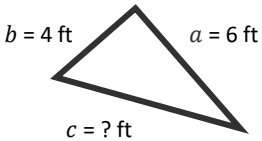
If we know the value of $c^2$, we can use the square root to find $c$.

$\sqrt{c^2}$ = _____ and this is the value of $c$.

**WRITE, PAIR, SHARE:**
*Can the hypotenuse or a leg be a decimal? Why or why not?*

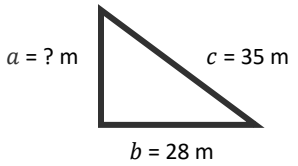
6. Using the measurements of the right triangle below, determine the following:

   $a^2$ = _____
   $b^2$ = _____
   $c^2$ = _____
   $c$ = _____




## What's My Leg Length?

**WRITE, PAIR, SHARE:**
*Using what you know about solving equations and the right triangle below, how would you find the missing leg of a right triangle?*
*Record your hypothesis in the box:*




*Check your understanding by solving for the missing leg of the same right triangle above.*

7. Solve for the missing leg.

   Set up the equation: $a^2 + b^2 = c^2$

   $b^2$ = _____

   $c^2$ = _____

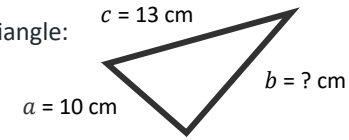
   Now, substitute the known values,

   $a^2$ + _____ = _____

   Solve for $a$ by isolating the variable, $a^2$.

   Then find the square root of $a^2$ and this is the value of $a$.

8. Solve for the missing leg of the right triangle:




   $b$ = _____