Pythagorean Theorem

- **Expressions, equations, and relationships.** The student applies mathematical process standards to develop mathematical relationships and make connections to geometric formulas. The student is expected to: **(C) use models and diagrams to explain the Pythagorean theorem.**

8.6

- **Expressions, equations, and relationships.** The student applies mathematical process standards to use geometry to solve problems. The student is expected to: **(C) use the Pythagorean Theorem and its converse to solve problems**

8.7

- **Expressions, equations, and relationships.** The student applies mathematical process standards to use geometry to solve problems. The student is expected to: **(D) determine the distance between two points on a coordinate plane using the Pythagorean Theorem.**

8.7

My teacher's Pythagorean Theorem **goals for me are that… I will be able to:**

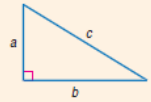
- **model** the Pythagorean Theorem using **squares**.
- **solve** problems using the **Pythagorean Theorem**.
- **use** the Pythagorean Theorem to calculate the **distance between two points** on a graph.

I will achieve the **learning goal(s)** for the **Pythagorean Theorem** by:

1) _____

2) _____

3) _____

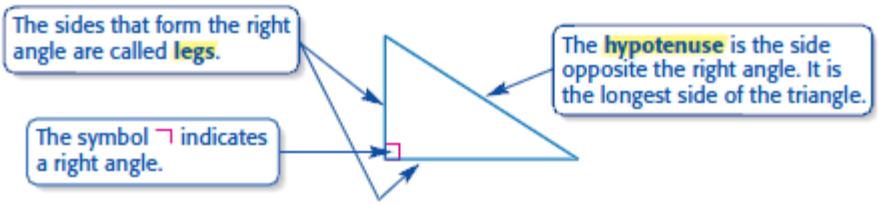
Square	Square Root	Pythagorean Theorem
Numbers such as 1, 4, 9, 16, and 25 are called *perfect squares*. Examples: $3^2 = 3 \times 3 = 9$ $5^2 = 5 \times 5 = 25$ $8^2 = 8 \times 8 = 64$ Write three of your own examples: 1. 2. 3.	The **opposite of squaring a number** is finding the **square root**. The **square root** of a number is one of its two equal factors. The symbol $\sqrt{\ }$, **radical sign**, is used to indicate a **square root**. *Examples:* $\sqrt{16} = 4$, because $4 \times 4 = 16$ $\sqrt{49} = 7$, because $7 \times 7 = 49$ Write three of your own examples: 1. 2. 3.	The **Pythagorean Theorem** describes the relationship between the lengths of the **legs** and the **hypotenuse** for any **right triangle**. **KEY CONCEPT** — Pythagorean Theorem **Words**: In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs. **Symbols**: $c^2 = a^2 + b^2$ **Model**:  You can use the **Pythagorean Theorem** to find the length of a side of a right triangle when you know the other two sides.

Pythagorean Theorem...Notes

The Pythagorean Theorem describes the relationship between the lengths of the **legs** and the **hypotenuse** for any **right triangle**.

In a **right triangle**, the sides that are adjacent to (touching) the **right angle** are called **legs**.

The side opposite the **right angle** is the **hypotenuse**.

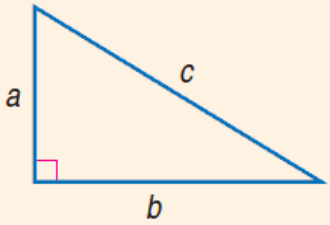


KEY CONCEPT — Pythagorean Theorem

Words In a right triangle, the square of the length of the hypotenuse is equal to the sum of the squares of the lengths of the legs.

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

Model



Modeling *the Pythagorean Theorem*

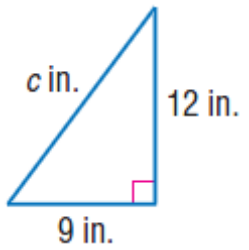
What does this mean for the Pythagorean Theorem?

KEY CONCEPT — Converse of Pythagorean Theorem

If the sides of a triangle have lengths a, b, and c units such that $c^2 = a^2 + b^2$, then the triangle is a right triangle.

I do...and you follow along and process *Modeling the* Pythagorean Theorem

A.



a = a^2 =

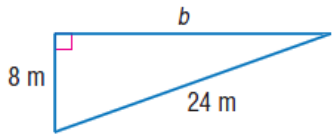
b = b^2 =

c = c^2 =

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

Work:

B.



a = a^2 =

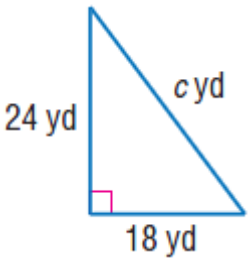
b = b^2 =

c = c^2 =

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

Work:

C.



a = a^2 =

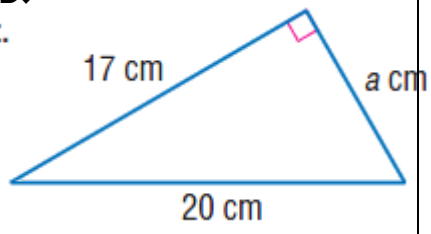
b = b^2 =

c = c^2 =

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

Work:

D.



a = a^2 =

b = b^2 =

c = c^2 =

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

Work: