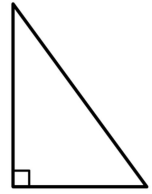Name _____

Date _____Pd_____

THE PYTHAGOREAN THEOREM

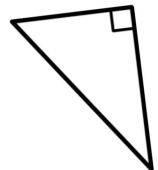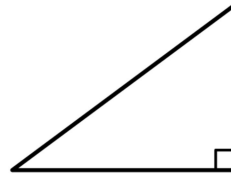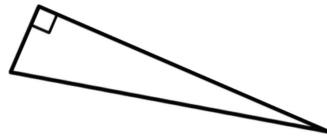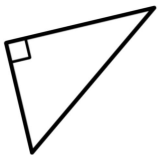| PARTS OF A RIGHT TRIANGLE	• In a right triangle, the two sides adjacent to the right angle are known as the _____, or _____ and _____. • The side opposite from the right angle is called the _____, or _____. • The hypotenuse is always the _____ side of a right triangle.
PYTHAGOREAN THEOREM	• The Pythagorean theorem tells us how the _____ lengths of _____ triangles are related. • In any right triangle, the _____ of the hypotenuse is equal to the sum of the _____ of the other two sides. This relationship can be represented by the equation: _____ + _____ = _____

Label a, b and c on each of the right triangles below.

Use the steps below to find the missing side length of the right triangle in example 1.
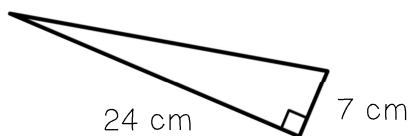
FINDING SIDE LENGTHS OF RIGHT TRIANGLES

• Label _____, _____ and _____.

• Substitute the known values into the _____ theorem.

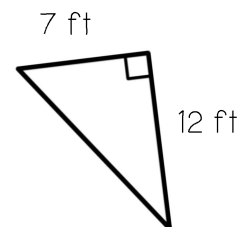• _____ for the missing variable.
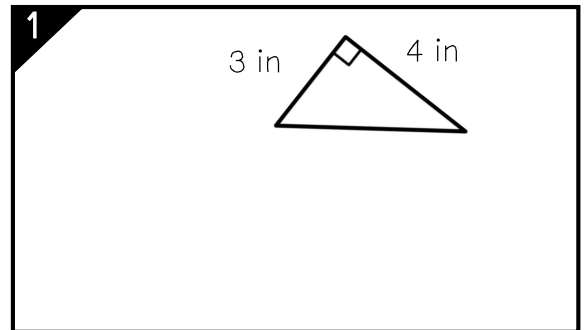
1

3 in   4 in

Find the missing side length of each right triangle. Round to the nearest tenth if necessary.
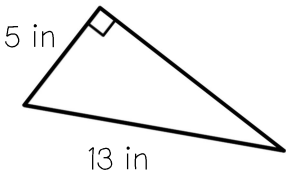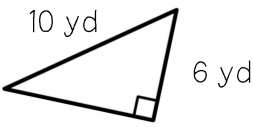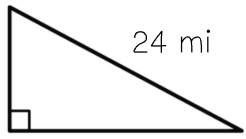
2.

24 cm   7 cm

3.

7 ft

12 ft

Use the Pythagorean theorem to find the missing side length in each right triangle. Round to the nearest tenth if necessary.

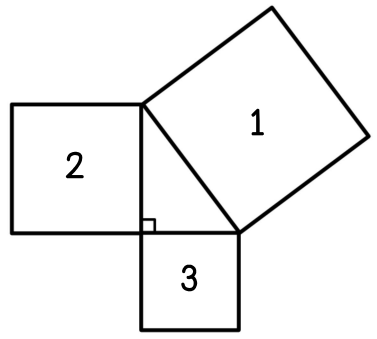| 4.	5.	6.
5 in, 13 in	10 yd, 6 yd	16 mi, 24 mi

Apply the Pythagorean theorem to answer 7-10. Round to the nearest tenth when necessary.

7. A rectangular pool at Andy's gym measures 25 meters by 50 meters. How many meters would Andy need to swim in order to swim diagonally across the pool?	8. A pole vaulter rests a 17-foot pole against a wall. If the top of the pole hits the wall 14 feet above the ground, how far from the wall is the bottom of the pole?

9. Use the diagram at the right to answer a and b.

a. If the area of square 2 is 64 units^2 and the area of square 3 is 36 units^2, find the area and the side length of square 1.

b. If the area of square 1 is 25 units^2, and the area of square 2 is 16 units^2, what is the perimeter of square 3?

1

2

3

10. The squares below form a model of the Pythagorean theorem. Malachi has solved and found the area of the center square to be 527 square units. Describe his error and find the correct answer.

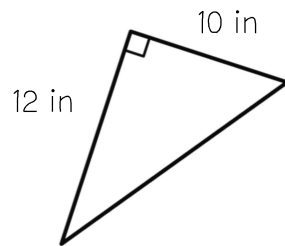P = 28 in

A = ?

P = 96 in

MALACHI

$7^2 + b^2 = 24^2$

$49 + b^2 = 576$

$b^2 = 527$ in^2

THE PYTHAGOREAN THEOREM

Use the Pythagorean theorem to help you solve the questions below.

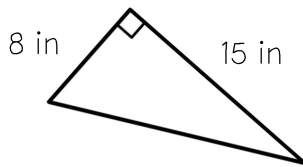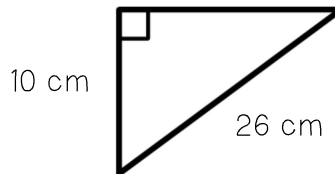|	
1. Which equation could be used to find the missing side length of the right triangle shown? 10 in 12 in A. $12^2 - 10^2 = c^2$ B. $12^2 + b^2 = 10^2$ C. $12(2) + 10(2) = c(2)$ D. $12^2 + 10^2 = c^2$	2. Which of the following statements is not a true statement? A. The legs of a triangle are the sides adjacent to the right angle. B. The hypotenuse is directly across from the right angle. C. The Pythagorean theorem can only be used with right triangles. D. The hypotenuse is always the shortest side length.

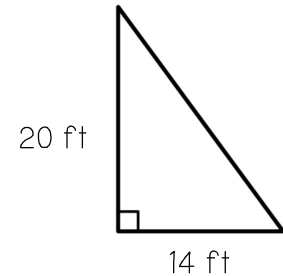In 3-8, find the missing side length of each right triangle. Round to the nearest tenth if needed.
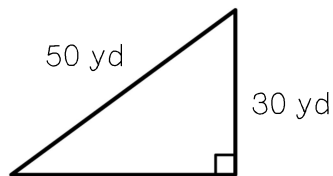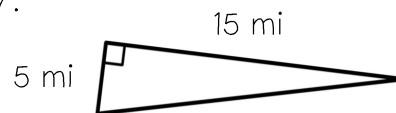
3. 8 in 15 in _____	4. 10 cm 26 cm _____	5. 20 ft 14 ft _____
6. 50 yd 30 yd _____	7. 15 mi 5 mi _____	8. 12 ft 20 ft _____