Name_____ Date_____

Unit 9: Pythagorean Theorem! Math 8R

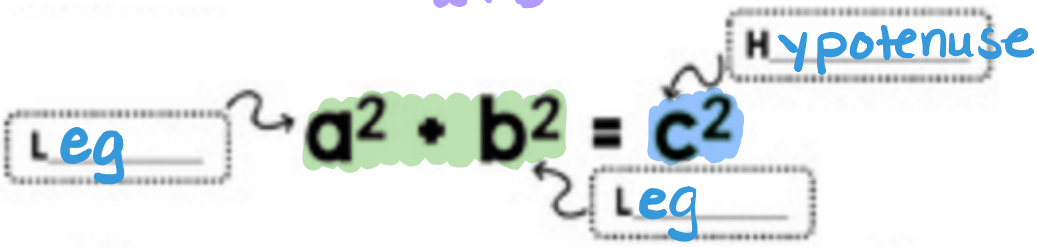
9-1: Converse of the Pythagorean Theorem

"I can use the Pythagorean Theorem to determine if a triangle is a right triangle."

The Pythagorean Theorem states that in a right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse.

a + b

c



- A Pythagorean Triple is a set of 3 positive integers that satisfy the Pythagorean Theorem.
- The **converse of the Pythagorean Theorem** states that IF the Pythagorean Theorem is true for the side lengths of a triangle, then is MUST be a RIGHT triangle.
- Remember: the two shorter sides are the legs, a and b.
- The longest side is called the hypotenuse, c.

Determine whether each triangle is a right triangle or not. Show all work, including formulas and substitutions.

1) 3, 5, 6 (c)

NO

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

$3^2 + 5^2 = 6^2$

$9 + 25 = 36$

$34 \neq 36$

2) 36, 77, 85 (c)

Yes

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

$36^2 + 77^2 = 85^2$

$1296 + 5929 = 7225$

$7225 = 7225$ ✓

3) 18, 80, 81 (c)

No

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

$18^2 + 80^2 = 81^2$

$324 + 6400 = 6561$

$6724 \neq 6561$

4) 0.9, 1.2, 1.5 (c)

Yes

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

$0.9^2 + 1.2^2 = 1.5^2$

$0.81 + 1.44 = 2.25$

$2.25 = 2.25$ ✓

Problem Set: Determine whether each triangle is or is not a right triangle. Show all work including formulas and substitutions.

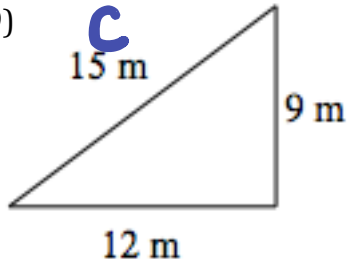
5) 20, 21, 29 C

6) 15, 24, 25

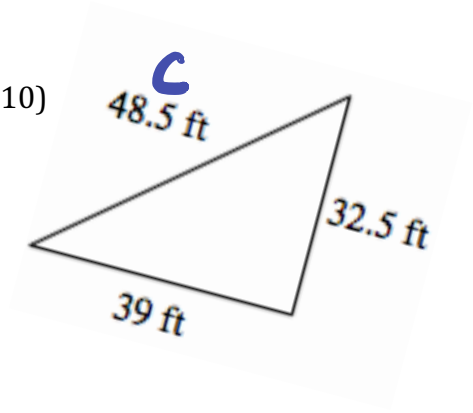
7) 3.6, 4.8, 6.2

8) 9, 41, 40

9) C



10) C



3-4-5 * Any multiple is also triple.

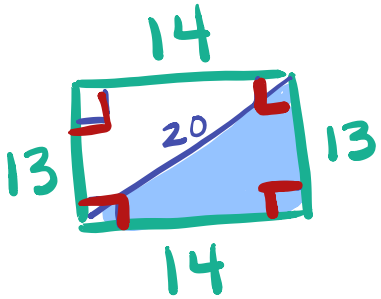
11) If 6-8-10 is a Pythagorean Triple, find 3 more similar Pythagorean Triples.

x2

12, 16, 20 18, 24, 30 30, 40, 50

9, 12, 15 60, 80, 100

12) Mr. Winston is adding a sunroom to his house. After laying the foundation and building the frame he double checks his measurements. Mr. Winston found that his 14 ft. by 13 ft. (rectangular) sunroom had a diagonal measurement of 20 ft. Why is Mr. Winston in trouble?



$13^2 + 14^2 = 20^2$

$169 + 196 = 400$

$365 \neq 400$

Not right angle → Not a rectangle.