A1 S2 w10d3 10.1 Pythagorean

Alg I Week 10 block Warm Up

1. Skill 15: Factor special polynomials completely.

$A)\quad 7x^3+21x^2-7x-21$ $B)\ 36x^2-25$

2. Skill 16: Solve a quadratic equation by factoring.

$4x^2=-22x-10$

3. Skill 17: Solve by Completing the Square. Leave the answer as an integer or in simplified radical form.

$5k^2=60-20k$

4. Skill 18: Solve a quadratic equation using the quadratic formula. Give answer in simplified radical form and then round answer to nearest hundredth.

$3x^2=10x+2$

5. Find the vertex and the axis of symmetry for: $y=2x^2+12x+10$

Alg1 wk10 Block ,CW/HW It's all Greek to Me!

The Pythagorean Theorem was named after the Greek mathematician Pythagoras who was credited with its discovery. This theorem states a relationship between all three sides of a right triangle. All right triangles have two sides called **legs** (these form the right angle) and a longest side called the **hypotenuse** (across from the right angle).

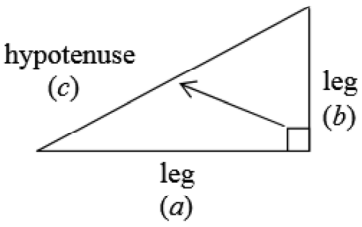
The Pythagorean Theorem

For right triangles only,

$(\text{leg})^2 + (\text{leg})^2 = (\text{hypotenuse})^2$

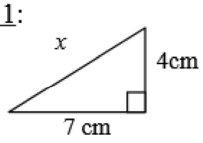
For the triangle shown to the right,

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



The following examples show how you can determine the length of one missing side if you are given two side lengths.

Example 1:



$\text{leg}^2 + \text{leg}^2 = \text{hypotenuse}^2$

$7^2 + 4^2 = x^2$

$49 + 16 = x^2$

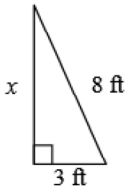
$65 = x^2$

$\sqrt{65} = x$

$8.1 \approx x$

The hypotenuse is about 8.1 cm long.

Example 2:



$\text{leg}^2 + \text{leg}^2 = \text{hypotenuse}^2$

$3^2 + x^2 = 8^2$

$9 + x^2 = 64$

$x^2 = 55$

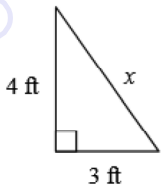
$x = \sqrt{55}$

$x \approx 7.4$

The missing leg is about 7.4 ft long.

Use the Pythagorean Theorem to find the length of the missing side in each of the following triangles. Show all of your steps and round your answers to the nearest tenth.

1.



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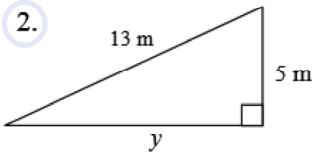

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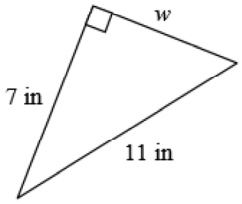

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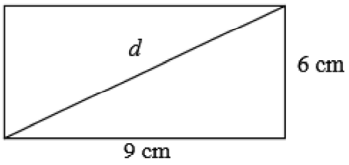
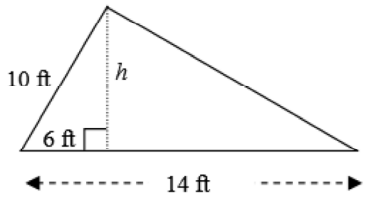
4. Find the length of the diagonal of the rectangle shown.

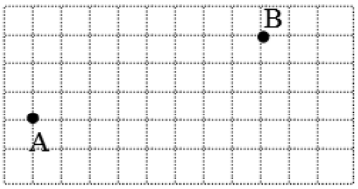


5. Find the height and area for the triangle shown.

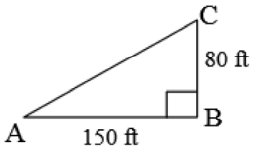


6. Televisions are marketed by the length of the diagonal across the screen. If a 19" color TV has a length of 16", find its height.

7. What is the distance from A to B? (Hint: draw a right triangle.)



8. Fred and Barney are running a race. Fred runs from A to B to C, while Barney travels directly from A to C. If Fred runs at a rate of 20 ft/sec compared to Barney's 15 ft/sec, who wins the race? Justify your answer.



Scrambled answers for #1-7: 5, ~8.5, ~8.5, ~10.2, ~10.8, 12, 56

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Which set of lengths could be the side lengths of a right triangle?

a. 6 in, 24 in, 25 in

b. 4 m, 8 m, 10 m

c. 10 in, 24 in, 25 in

d. 8 ft, 15 ft, 16 ft

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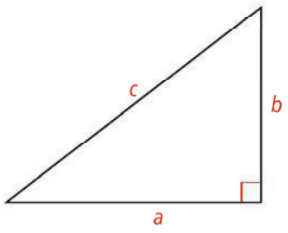
HW: complete CW and p 617: #9, 25, 26, 29, 32

Use the triangle at the right. Find the missing side length. If necessary, round to the nearest tenth.

9. $a = 5, c = 13$

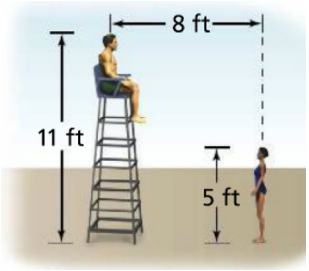


Determine whether the given lengths can be side lengths of a right triangle.

25. 13 in., 35 in., 38 in.

26. 16 cm, 63 cm, 65 cm

29. Swimming A swimmer asks a question to a lifeguard sitting on a tall chair, as shown in the diagram. The swimmer needs to be close to the lifeguard to hear the answer. What is the distance between the swimmer's head and the lifeguard's head?



Any set of three positive integers that satisfies the equation $a^2 + b^2 = c^2$ is a *Pythagorean triple*. Determine whether each set of numbers is a Pythagorean triple.

32. 40, 41, 58