10.2c Homework: The Pythagorean Theorem and Unknown Side Lengths

Directions: Two side lengths of a right triangle have been given. Solve for the missing side length if a and b are leg lengths and c is the length of the hypotenuse. Leave your answer in simplest radical form.

1. $a = 16$, $b = 30$, $c = ?$

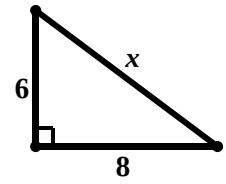
2. $a = 2$, $b = 2$, $c = ?$

3. $a = 40$, $b = ?$, $c = 50$

4. $a = ?$, $b = 4\sqrt{3}$, $c = 8$

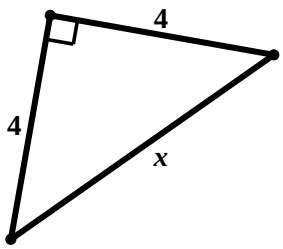
Directions: Find the value of x using the Pythagorean Theorem. Leave your answer in simplest radical form.

5.



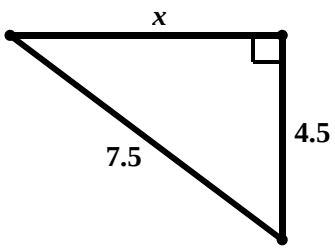
$x =$ _____

6.



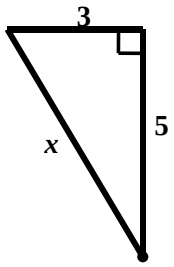
$x =$ _____

7.



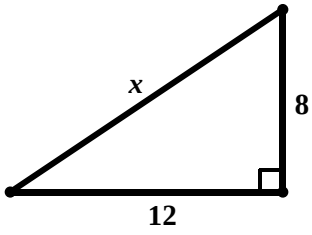
$x =$ _____

8.



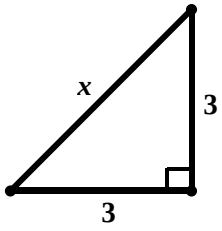
$x =$ _____

9.



$x =$ _____

10.



$x =$ _____

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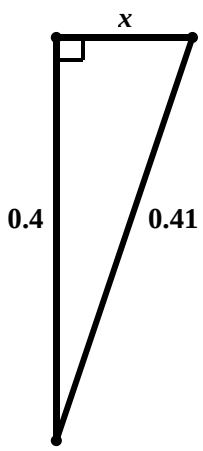
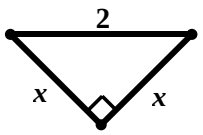
11.



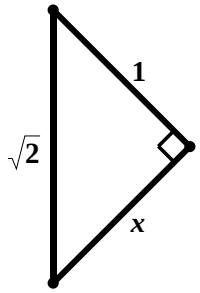
x = _____

12.



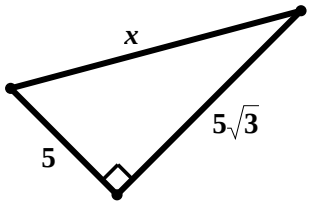
x = _____

13.



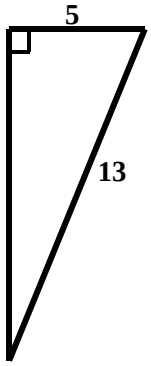
x = _____

14.



x = _____

15. **Find, Fix, and Justify:** Megan was asked to solve for the unknown side length in the triangle below. Her work is shown below. She made a mistake when solving. Explain the mistake she made and then solve the problem correctly.



Megan's Solution:

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

$5^2 + 13^2 = c^2$

$25 + 169 = c^2$

$194 = c^2$

$\sqrt{194} = c$

Explain Mistake:

Correct Solution:

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16. **Find, Fix, and Justify:** Raphael was asked to solve for the length of the hypotenuse in a right traingle with legs that have side lengths of 4 and 5. His work is shown below. He made a mistake when solving. Explain the mistake and then solve the problem correctly.

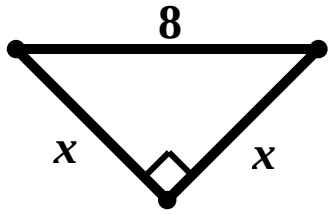
Raphael's Solution:

$a^2 + b^2 = c^2$
$4^2 + 5^2 = c^2$
$16 + 25 = c^2$
$41 = c$

Correct Solution:

Explain Mistake:

17. **Find, Fix, and Justify:** Nataani was asked to solve for the unknown side length in the triangle below. His work is shown below. He made a mistake when solving. Explain the mistake and then solve the problem correctly.



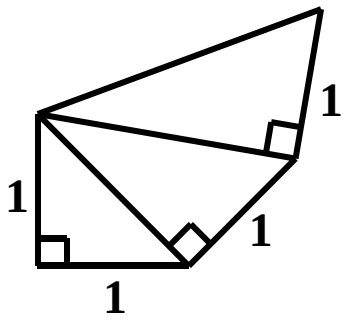
Nataani's Solution:

$a^2 + b^2 = c^2$
$x^2 + x^2 = 8$
$2x^2 = 8$
$x^2 = 4$
$x = 2$

Correct Solution:

Explain Mistake:

Extra for Experts: Use the picture below to answer questions a) and b).



a. Find all the missing side lengths and label the picture with the answers.
b. Using the picture above, devise a strategy for constructing a segment with a length of $\sqrt{5}$. Explain your strategy below.

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