Possible Solutions

Joe is making a sun catcher for a glass project with various types of different sized triangles including right triangles. Which of the following measurements could not represent the side lengths of a right triangle?

a) 6 cm, 8 cm, 10 cm

b) b) 4 cm, 6 cm, 10 cm

c) 10 cm, 24 cm, 26 cm

d) 7 cm, 24 cm, 25 cm

Possible Solution 1

- Use the Pythagorean Theorem to verify each of the possible side lengths to determine if $a^2 + b^2 = c^2$.

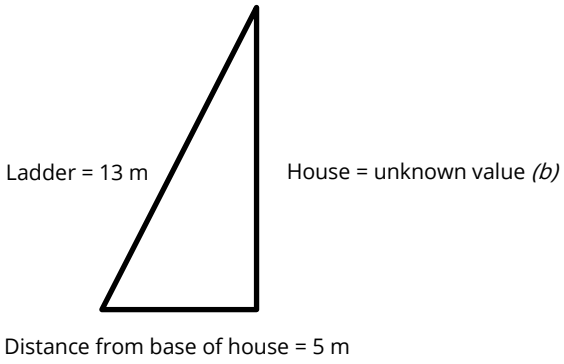
$$4^2 + 6^2 = 16 + 36 = 52$$

$$10^2 = 100$$

- Since $52 \neq 100$, the length of these three sides cannot make a right triangle.

Possible Solution 2

- You could draw a model or use centimeter cubes to verify which numbers would satisfy the Pythagorean Theorem.



- Knowing Pythagorean Triples is helpful for this problem. One of the triples is 5, 12, 13. This triple can be used to solve this problem.

Possible Solution 3

a) 6 cm, 8 cm, 10 cm

- Draw a grid that is ten by ten. Color 36 squares red to represent the side that is 6 cm ($6^2 = 36$). Color 64 squares blue to represent the side that is 8 cm ($8^2 = 64$). Are they any squares you did not color? If not, then the numbers can be a right triangle.

b) 4 cm, 6 cm, 10 cm

- Draw a grid that is ten by ten. Color 16 squares red to represent the side that is 4 cm ($4^2 = 16$). Color 36 squares blue to represent the side that is 6 cm ($6^2 = 36$). Are they any squares you did not color? If not, then the numbers can be a right triangle. There will be uncolored squares.

c) 10 cm, 24 cm, 26 cm

- Draw a grid that is 26 by 26. Color 10 squares red to represent the side that is 10 cm ($10^2 = 100$). Color 576 squares blue to represent the side that is 24 cm ($24^2 = 576$). Are they any squares you did not color? If not, then the numbers can be a right triangle.

d) 7 cm, 24 cm, 25 cm

- Draw a grid that is 25 by 25. Color 49 squares red to represent the side that is 7 cm ($7^2 = 49$). Color 576 squares blue to represent the side that is 24 cm ($24^2 = 576$). re they any squares you did not color? If not, then the numbers can be a right triangle.

b) is the correct answer. These three numbers do not hold to the model and do not make a right triangle.