

9.1 – 9.3:

Pythagorean Inequalities and Triples, Special Right Triangles, and Similar Triangles

9.1 Pythagorean Theorem

Pythagorean Theorem can be used for more than just finding the lengths of a right triangle. It can also determine whether a triangle is obtuse, right, or acute.

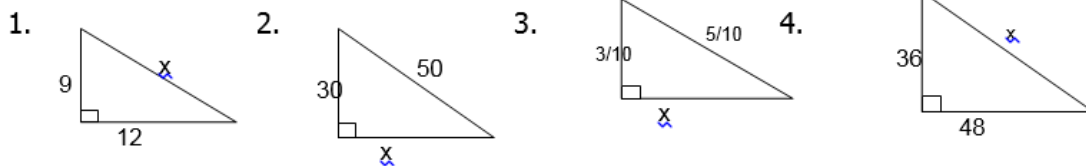
A. Summarize the rule that determines if the triangle is obtuse, right or acute.

B. Identify the triangles below.

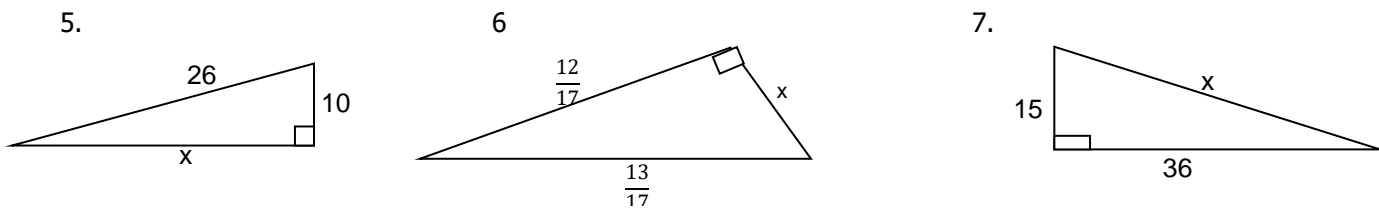
1. 4, 5, 5 _____
2. 2, 10, 11 _____
3. 3, 4, 5 _____

* The numbers 3, 4, and 5 are called a **Pythagorean triple**. Not only do 3, 4 and 5 make a right triangle, so do any multiples of 3, 4 and 5. If you are given 2 sides of a triangle and notice that they are multiples of 3, 4, or 5, then all you have to do is find the **scale factor** and use it to find the missing side. You can just multiply by the scale factor or set up a proportion. This is quicker and easier than using Pythagorean Theorem all the time. There are other triples besides 3, 4, 5. The triples that we will be using are: **3, 4, 5; 5, 12, 13; 7, 24, 25; 8, 15, 17**

Find the missing sides below by using the triple 3, 4, 5.

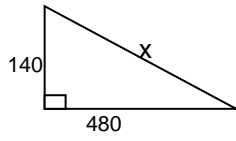


Now try to use the triple to find the missing side and scale factor: 5, 12, 13

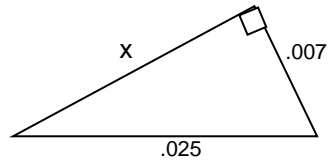


7, 24, 25

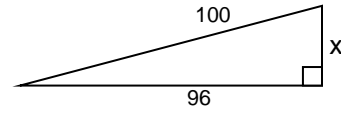
8.



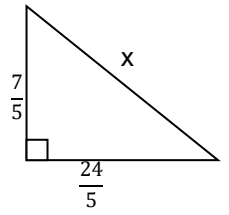
9.



10.

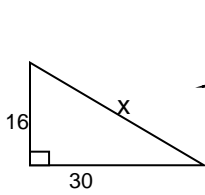


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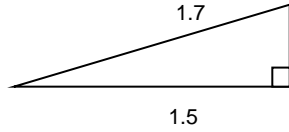


8, 15, 17

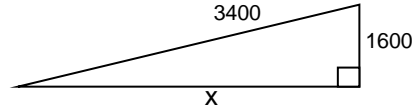
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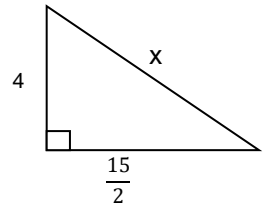
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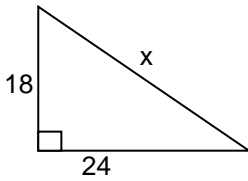


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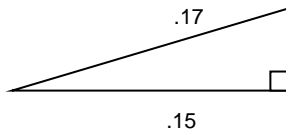


Now try these mixed up! You decide..... 3,4,5; 5,12,13; 7,24,25; or 8,15,17 !! Find x.

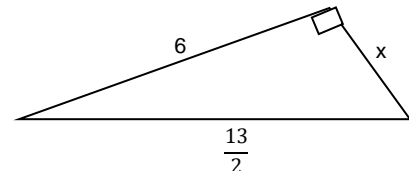
16. _____



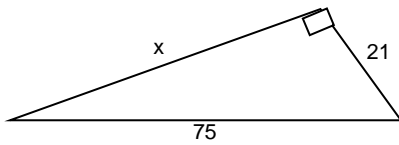
17. _____



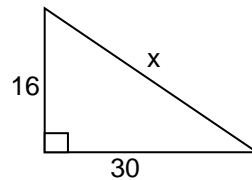
18. _____



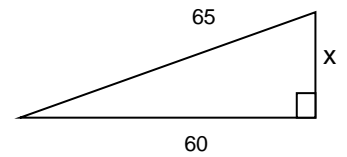
19. _____



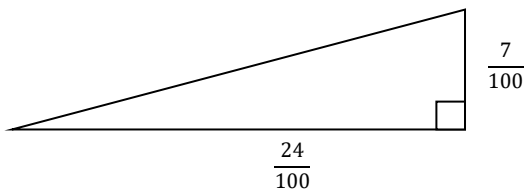
20. _____



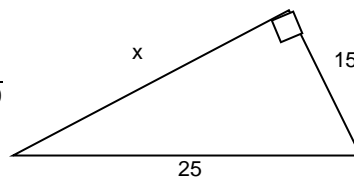
21. _____



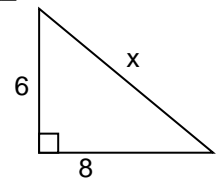
22. _____



23. _____

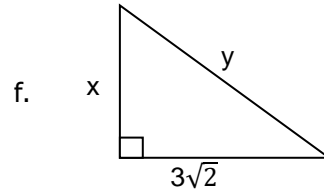
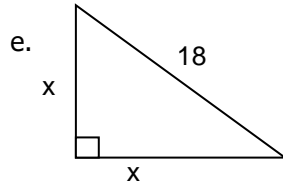
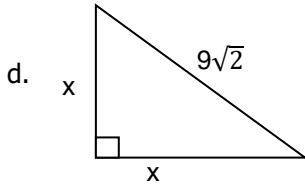
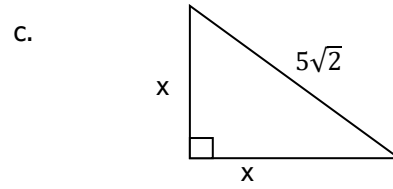
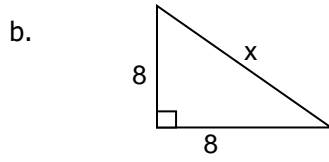
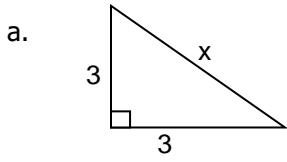


24. _____



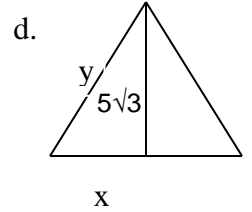
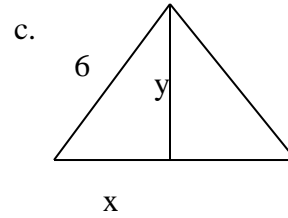
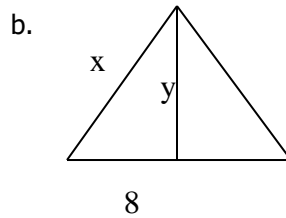
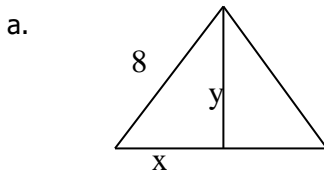
9.2 Special Right Triangles

25. Given the isosceles right triangles, find the missing length using Pythagorean Theorem.



29. The above triangles are all 45° - 45° - 90° triangles, are they all similar? Draw and label the base triangle that will always help you set up the proportion to find missing side lengths.

30. Given the equilateral triangles with **altitudes**, find the variables using the 30° - 60° - 90° proportions.



31. Are all 30° - 60° - 90° triangles above similar? Draw and label the base triangle that will always help you set up the proportion to find missing side lengths.

9.3 Similar Right Triangles

Find the geometric mean of the two numbers.

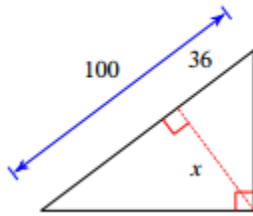
32. 3 and 12

33. 4 and 14

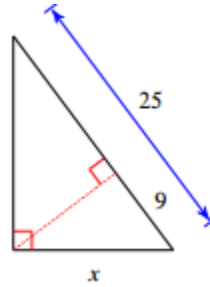
34. 10 and 24

Find the missing length indicated. Leave your answers exact (in simplest radical form).

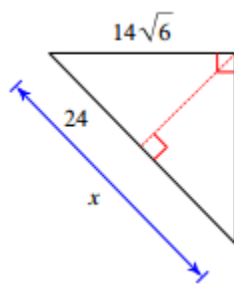
35.



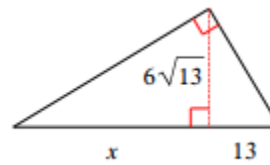
36.



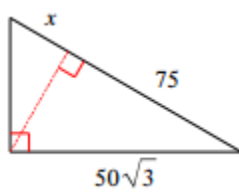
37.



38.



39.



40.

