Practice for the Instructional Guide Lesson on Computing the Geometric Mean.

Find the geometric mean of each pair of numbers

1. 8 and 32
2. 5 and 125
3. 3 and 48
4. 4 and 10
5. 9 and 24
6. 3 and 16
7. 4 and 49
8. 1 and 1000
9. 1.25 and 5
10. $\sqrt{2}$ and $\sqrt{6}$
11. $\sqrt{5}$ and $\sqrt{6}$
12. 12 and 18

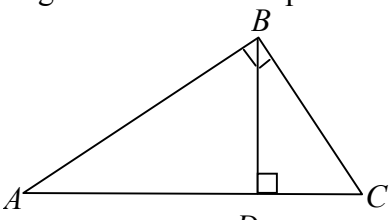
13. The geometric mean of 4 and x is 12. What is the value of x?

Investigation for the Instructional Guide Lesson on Altitudes Drawn to the Hypotenuse of a Right Triangle.

- Draw one diagonal on a sheet of rectangular paper, cut the paper on the diagonal to make two congruent triangles.
- In one of the triangles, use paper folding to locate the altitude to the hypotenuse. Cut the triangle along the altitude to make two smaller right triangles.
- Number the angles in the large right triangle 1,2, and 3.
- Number the angles in the smaller triangles 4, 5, 6 and 7,8, 9.
- Compare the angles of the triangle by placing the angles on top of one another.

Answer the following questions using the triangles.

1. Which angles have the same measure as angle 1? _____
2. Which angles have the same measure as angle 2? _____
3. Which angles have the same measure as angle 3? _____
4. Based on your results, write a conjecture about the three triangles.
5. Use the diagram below to complete the similarity statement.



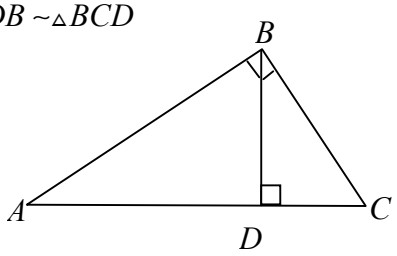
$\triangle ABC \sim \triangle$_____ $\sim \triangle$_____

Prove the following theorem.

The altitude to the hypotenuse of a right triangle divides the triangle into two triangles that are similar to the original triangle and to each other.

Given: Right triangle ABC.
$\overline{BD}$ is the altitude to the hypotenuse.

Prove: $\triangle ABC \sim \triangle ADB \sim \triangle BCD$

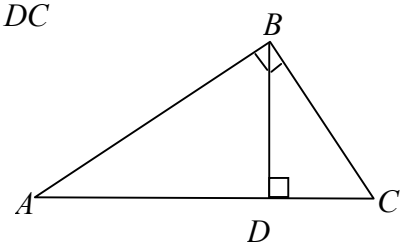


Prove the following corollary:

The length of the altitude to the hypotenuse of a right triangle is the geometric mean of the lengths of the segments of the hypotenuse.

Given: Right triangle ABC.
$\overline{BD}$ is the altitude to the hypotenuse.

Prove: $BD = \sqrt{AD \cdot DC}$

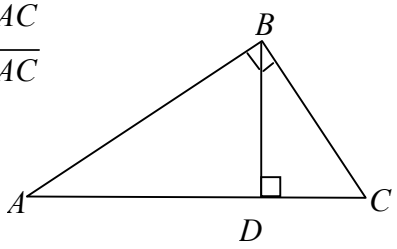


Prove the following corollary:

The altitude to the hypotenuse of a right triangle separates the hypotenuse so that the length of each leg of the triangle is the geometric mean of the length of the adjacent hypotenuse segment and the length of the hypotenuse.

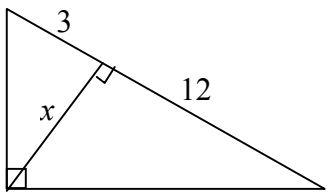
Given: Right triangle *ABC*.
$\overline{BD}$ is the altitude to the hypotenuse.

Prove: $AB = \sqrt{AD \cdot AC}$
$BC = \sqrt{BD \cdot AC}$

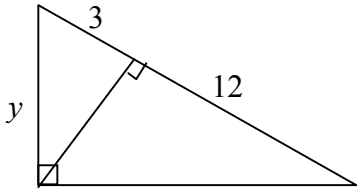


Guided Practice for the Instructional Guide Lesson on Altitudes Drawn to the Hypotenuse of a Right Triangle.

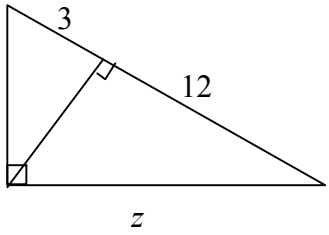
Solve for x:



Solve for y:

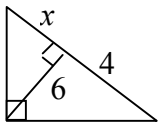


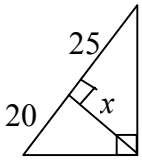
Solve for z:

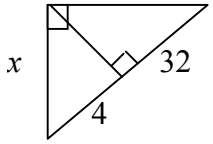


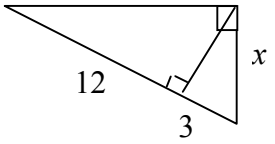
Independent Practice for the Instructional Guide Lesson on Altitudes Drawn to the Hypotenuse of a Right Triangle.

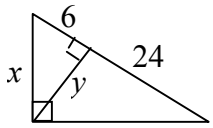
Solve for the variable(s):

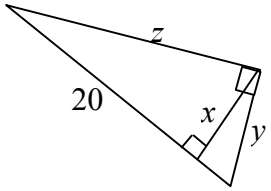
1. 

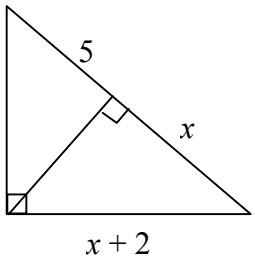
2. 

3. 

4. 

5. 

6. 

7. 

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