

Assignment

Write

Write the term from the box that best completes each statement.

Right Triangle/Altitude Similarity Theorem	geometric mean
Right Triangle Altitude/Hypotenuse Theorem	Right Triangle Altitude/Leg Theorem

1. The _____ states that if an altitude is drawn to the hypotenuse of a right triangle, then the two triangles formed are similar to the original triangle and to each other.
2. The _____ states that if the altitude is drawn to the hypotenuse of a right triangle, each leg of the right triangle is the geometric mean of the measure of the hypotenuse and the measure of the segment of the hypotenuse adjacent to the leg.
3. The _____ of two positive numbers a and b is the positive number x such that $\frac{a}{x} = \frac{x}{b}$.
4. The _____ states that the measure of the altitude drawn from the vertex of the right angle of a right triangle to its hypotenuse is the geometric mean between the measures of the two segments of the hypotenuse.

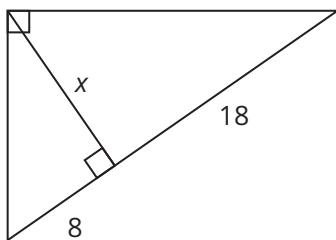
Remember

An altitude drawn to the hypotenuse of a right triangle divides the right triangle into triangles similar to the original triangle and to each other. The equivalent proportions of the sides of the triangles show that the altitude is the geometric mean of the measures of the two segments of the hypotenuse.

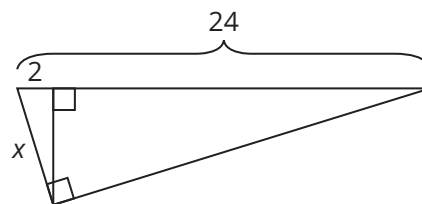
Practice

1. The geometric mean of two numbers is 20. One of the numbers is 50. What is the other number?
2. The geometric mean of two numbers is $5\sqrt{3}$. One of the numbers is 3. What is the other number?
3. Determine each unknown side length.

a.

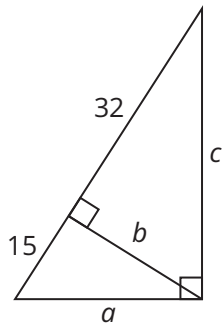


b.

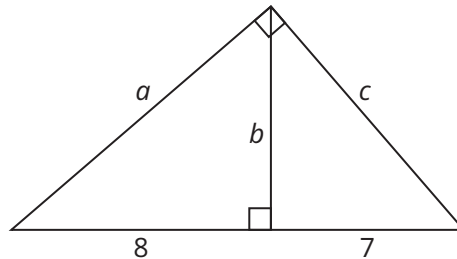


4. Determine the unknown side lengths in each triangle.

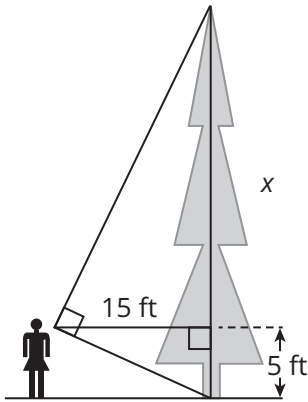
a.



b.

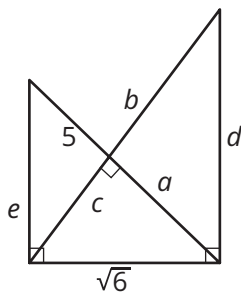


5. You are standing 15 feet from a tree. Your line of sight to the top of the tree and to the bottom of the tree forms a 90-degree angle as shown in the diagram. The distance between your line of sight and the ground is 5 feet. Estimate the height of the tree.

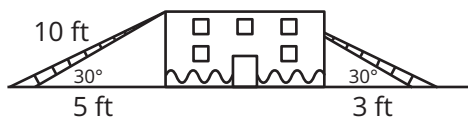


Stretch

1. Determine each unknown side length.



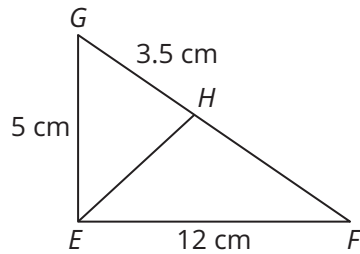
2. Two ladders are leaning against a building as shown.



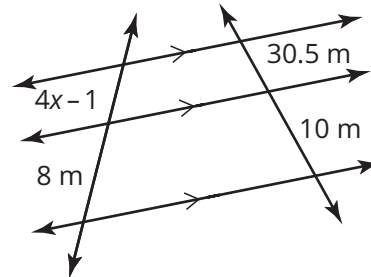
- Each ladder forms a triangle with the ground and the wall. Are the two triangles similar? Explain your reasoning.
- Determine the length of the smaller ladder. Explain your reasoning.

Review

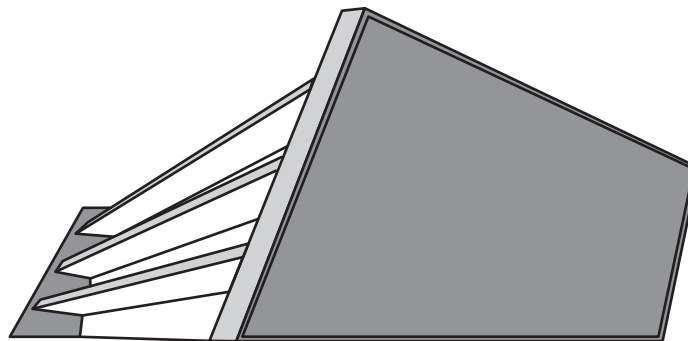
1. \overline{EH} bisects $\angle E$. Calculate HF .



2. Use the Proportional Segments Theorem to determine the unknown segment length.



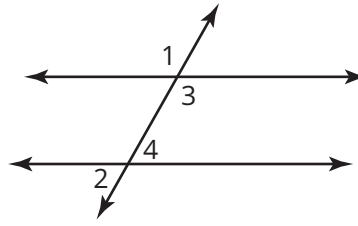
3. Consider the building shown. The side of the building is a quadrilateral. Classify the quadrilateral based only on each piece of given information.



- The four angles of the quadrilateral are congruent.
- The diagonals of the quadrilateral are congruent.

4. Provide the statements to complete the proof.

Given: $\angle 1$ and $\angle 2$ are supplementary.
Prove: $\angle 3$ and $\angle 4$ are supplementary.



Statements	Reasons
1.	1. Given
2.	2. Definition of supplementary angles
3.	3. Vertical angles are congruent
4.	4. Definition of congruent angles
5.	5. Substitution
6.	6. Definition of supplementary angles