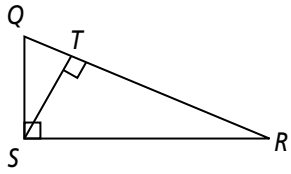
6.4

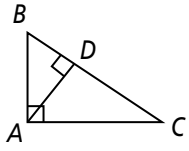
Similarity in Right Triangles

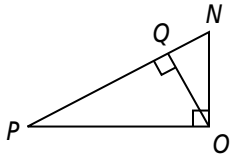
Identify the following in right $\triangle QRS$.

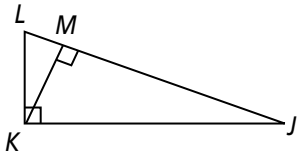


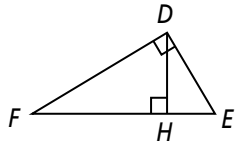
1. the hypotenuse
2. the segments of the hypotenuse
3. the altitude
4. the segment of the hypotenuse adjacent to leg $\overline{QS}$

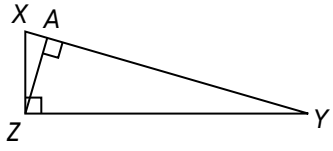
Write a similarity statement relating the three triangles in the diagram.

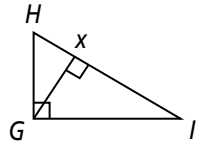
5. 

6. 

7. 

8. 

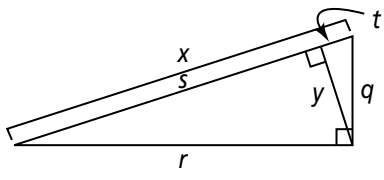
9. 

10. 

Algebra Find the geometric mean of each pair of numbers.

11. 9 and 4	**12.** 14 and 6	**13.** 9 and 30
14. 25 and 49	**15.** 4 and 120	**16.** 9 and 18
17. 16 and 64	**18.** 5 and 25	**19.** 12 and 16

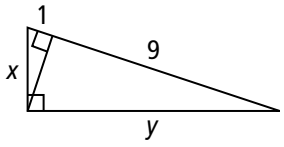
Use the figure at the right to complete each proportion.



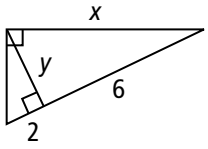
20. $\frac{q}{r} = \frac{\square}{y}$ **21.** $\frac{s}{y} = \frac{\square}{t}$ **22.** $\frac{t}{q} = \frac{q}{\square}$

23. $\frac{q}{x} = \frac{t}{\square}$ **24.** $\frac{s}{r} = \frac{\square}{q}$ **25.** $\frac{\square}{r} = \frac{r}{x}$

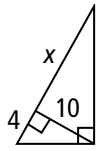
26.



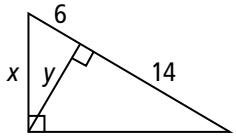
27.



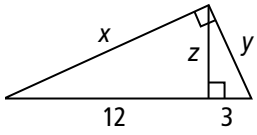
28.



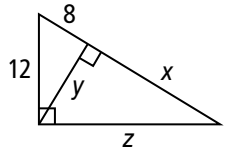
29.



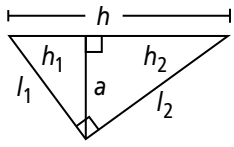
30.



31.



The diagram shows the parts of a right triangle with an altitude to the hypotenuse. For the two given measures, find the other four. Use simplest radical form.



32. $h = 12, h_1 = 4$

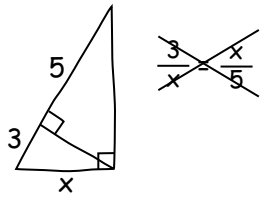
33. $a = 6, h_2 = 9$

34. $\ell_1 = 6\sqrt{3}, h_2 = 3$

35. $h_1 = 5, \ell_2 = 2\sqrt{51}$

36. The altitude of the hypotenuse of a right triangle divides the hypotenuse into 45 in. and 5 in. segments. What is the length of the altitude?

37. Error Analysis A classmate writes an incorrect proportion to find *x*. Explain and correct the error.



38. Draw a Diagram The sides of a right triangle measure $6\sqrt{3}$ in., 6 in., and 12 in. If an altitude is drawn from the right angle to the hypotenuse, what is the length of the segment of the hypotenuse adjacent to the shorter leg? What is the length of the altitude?