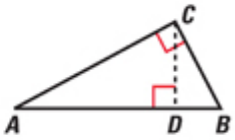
Honors Geometry

Notes Section 7.3

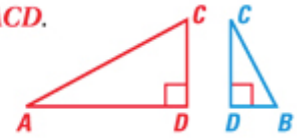
Use Similar Right Triangles

THEOREM 7.5

If the 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.



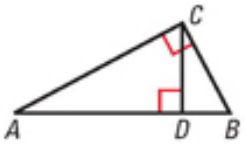
$\triangle CBD \sim \triangle ABC$, $\triangle ACD \sim \triangle ABC$, and $\triangle CBD \sim \triangle ACD$.



THEOREM 7.6 Geometric Mean (Altitude) Theorem

In a right triangle, the altitude from the right angle to the hypotenuse divides the hypotenuse into two segments.

The length of the altitude is the geometric mean of the lengths of the two segments.

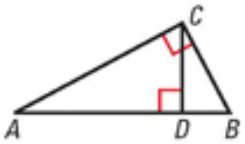


$$\frac{BD}{CD} = \frac{CD}{AD}$$

THEOREM 7.7 Geometric Mean (Leg) Theorem

In a right triangle, the altitude from the right angle to the hypotenuse divides the hypotenuse into two segments.

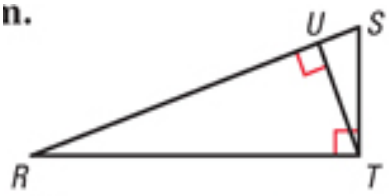
The length of each leg of the right triangle is the geometric mean of the lengths of the hypotenuse and the segment of the hypotenuse that is adjacent to the leg.



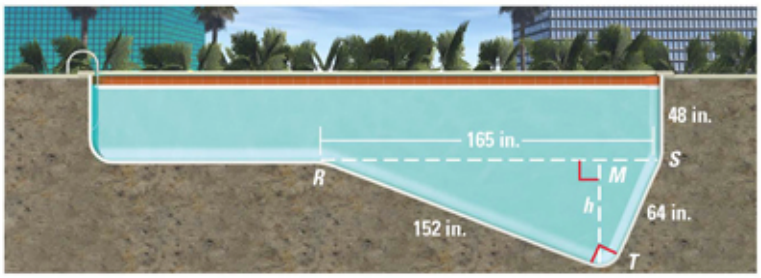
$$\frac{AB}{CB} = \frac{CB}{DB} \text{ and } \frac{AB}{AC} = \frac{AC}{AD}$$

EXAMPLE 1 Identify the similar triangles in the diagram.

n.



Example 2 The diagram below show a cross-section of a swimming pool. What is the maximum depth of the pool?



a) Identify the similar triangles _____

b) Find h using a proportion

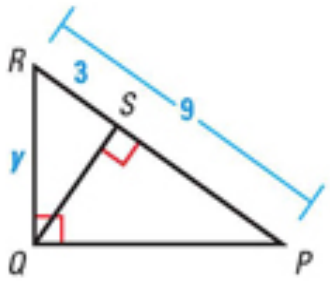
c) Add the minimum depth to find the maximum depth

_____

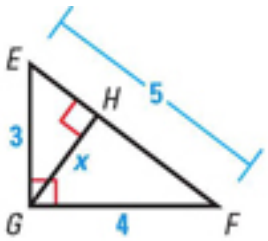
Geometric Mean: _____

EXAMPLE 3 Find the value of y. Write your answer in simplest radical form.

a)

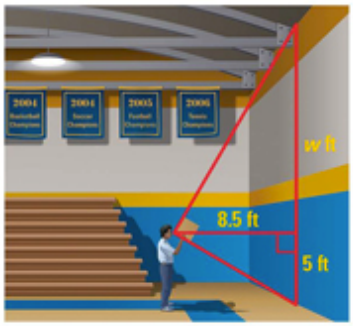


b)



EXAMPLE 4 Find x and w.

a)



b)