

3.4 Similarity in Right Triangles

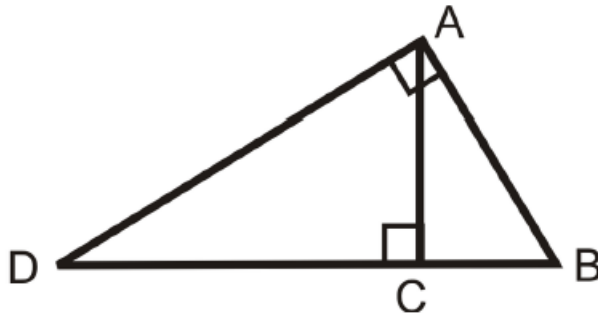
Objective: Students will be able to identify similar triangles inscribed in a right triangle

Inception: Similar right triangles within a right triangle

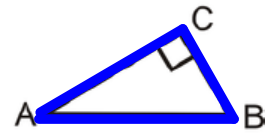
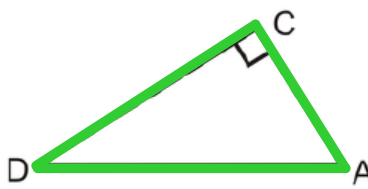
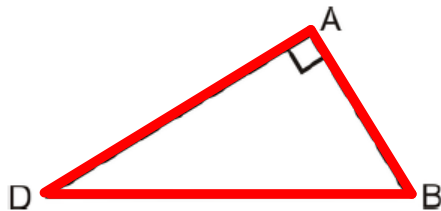
If an _____ is drawn from the right angle a right triangle, then two similar right triangles are formed within the right triangle

↓
Altitude

a line that extends from one vertex of a triangle perpendicular to the opposite side

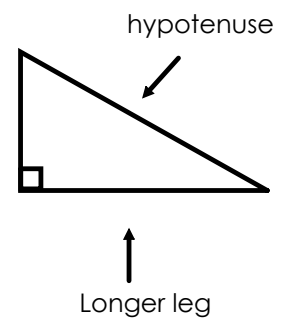
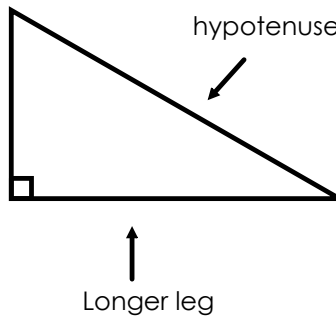
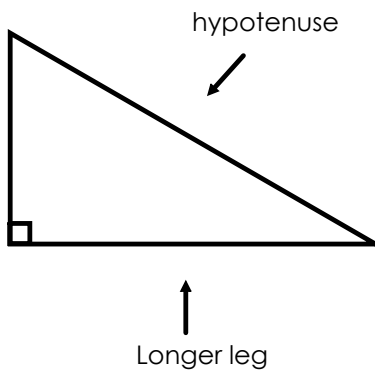
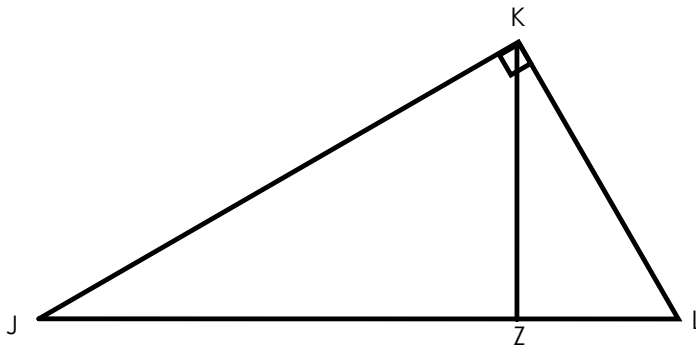


_____ ~ _____ ~ _____



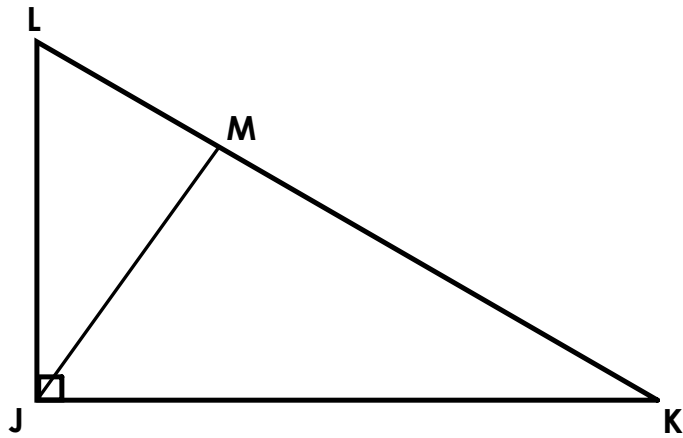
This means that all of the corresponding sides are proportional. You can use this fact to find missing lengths in right triangles.

Write the similarity statement for the three triangles in the diagram. Label the triangles below.



_____ ~ _____ ~ _____

In $\triangle JML$, we know $LM = 3$ and $MK = 9$. What is the length of JM ?



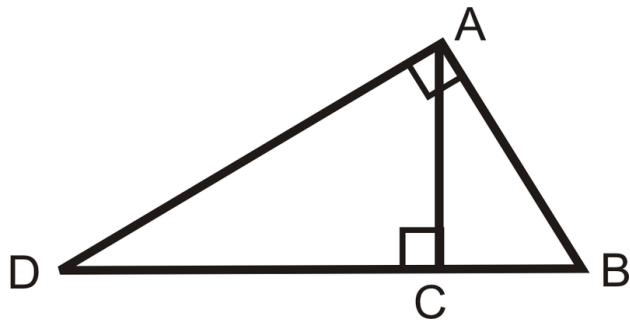
Step 2: Set up ratio and solve

_____ = _____

Step 1: Draw and label three similar triangles

_____ ~ _____ ~ _____

In the figure below, $CD = 12$ and $CB = 5$. What is the length of \overline{AB} ?



Step 2: Set up ratio and solve

_____ = _____

Step 1: Draw and label three similar triangles

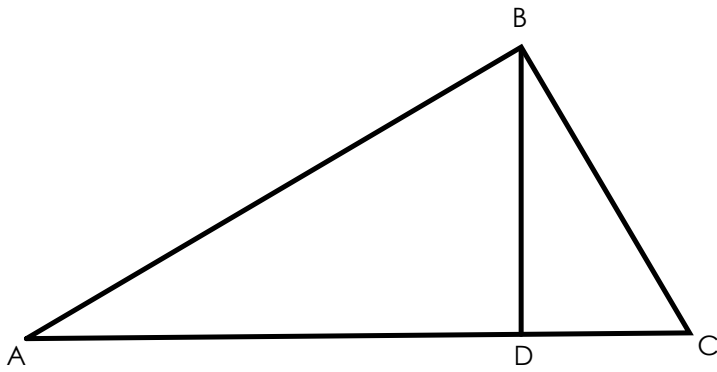
_____ ~ _____ ~ _____

Independent Practice

Write the similarity statement for the right triangles in each diagram.

_____ ~ _____ ~ _____

In the figure below, $AD = 8$ and $DC = 9$. What is the length of BD ?



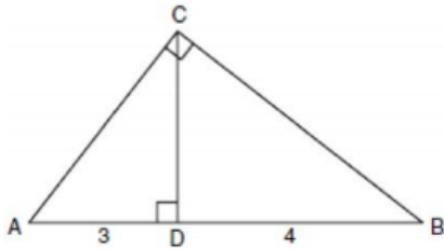
Step 2: Set up ratio and solve

_____ = _____

Step 1: Draw and label three similar triangles

_____ ~ _____ ~ _____

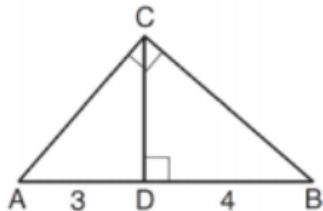
In the diagram below of right triangle ACB , altitude \overline{CD} intersects \overline{AB} at D . If $AD = 3$ and $DB = 4$, find the length of \overline{CD} in simplest radical form.



Step 1: Draw and label three similar triangles

_____ ~ _____ ~ _____

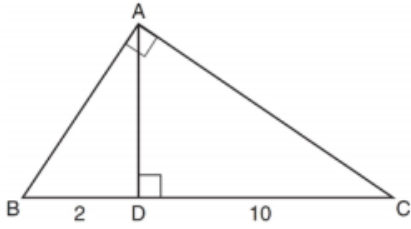
In the diagram below of right triangle ABC , \overline{CD} is the altitude to hypotenuse AB , $AD = 3$, and $DB = 4$.



What is the length of \overline{CB} ?

Step 1: Draw and label three similar triangles

Triangle $\triangle ABC$ shown below is a right triangle with altitude \overline{AD} drawn to the hypotenuse \overline{BC} .



If $BD = 2$ and $DC = 10$, what is the length of \overline{AB} ?

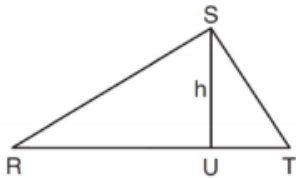
- 1) $2\sqrt{2}$
- 2) $2\sqrt{5}$
- 3) $2\sqrt{6}$
- 4) $2\sqrt{30}$



Hint: Convert all radicals to decimals!

SHOW ALL WORK BY DRAWING ALL TRIANGLES

In $\triangle RST$ shown below, altitude \overline{SU} is drawn to \overline{RT} at U .



If $SU = h$, $UT = 12$, and $RT = 42$, which value of h will make $\triangle RST$ a right triangle with $\angle RST$ as a right angle?

- 1) $6\sqrt{3}$
- 2) $6\sqrt{10}$
- 3) $6\sqrt{14}$
- 4) $6\sqrt{35}$

Stuck? Check out the hint under the video for help.