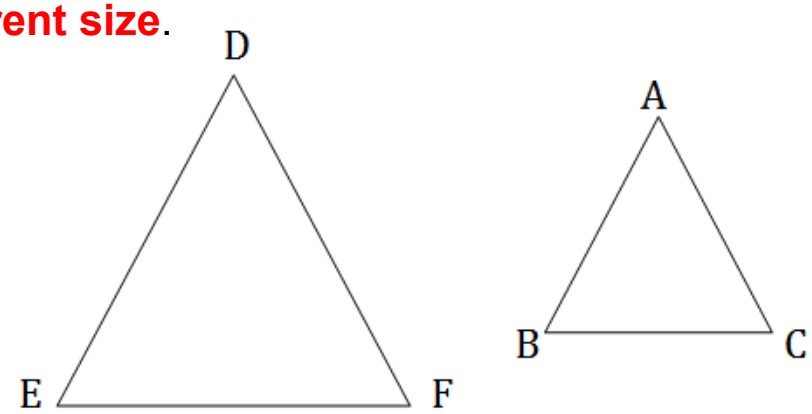
Section 7.4: Similar Triangles

Two triangles are similar if they have the **same shape**, but **different size**.



In similar triangles:

- **matching angles are equal**
- **matching sides are proportional**

To write the similarity statement, corresponding angles and sides must match up.

$$\Delta ABC \sim \Delta DEF$$

You can write 6 true statement from the similarity of two triangles.

1.

2.

3.

4.

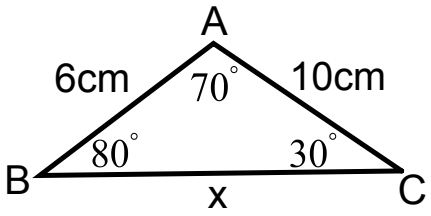
5.

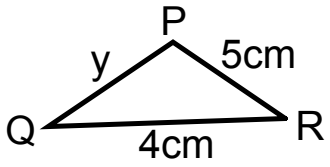
6.

When writing proportions for corresponding sides, make sure to keep the same triangle on top in each fraction.

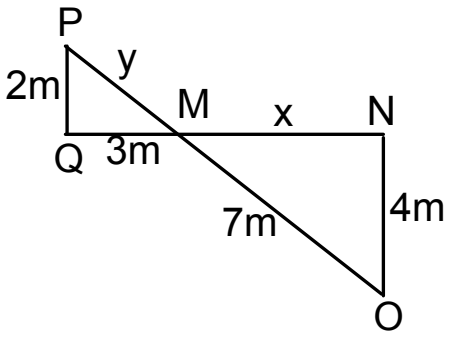
Example # 1

$\triangle ABC \sim \triangle PQR$ find the angle measurements of $\triangle PQR$ and the missing side measurements x and y.





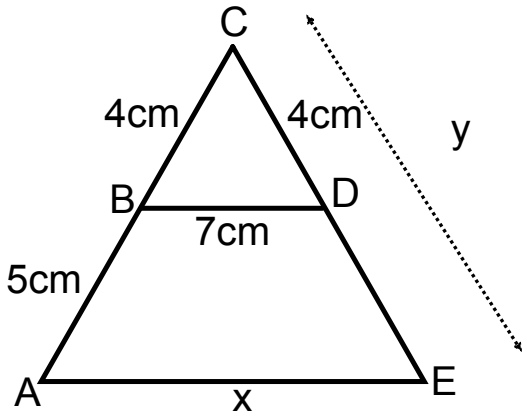
Example #2



Identify the 2 similar triangles and determine the missing sides.

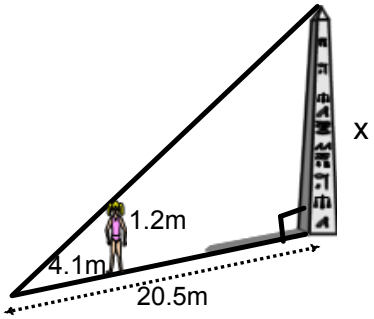
Example # 3

Identify the similar triangles and identify the missing measures.

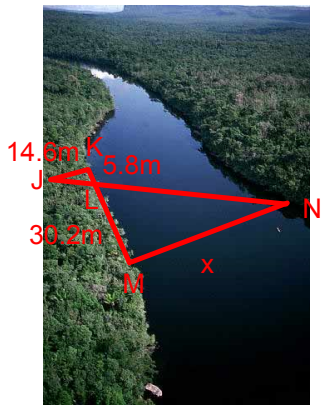


Similar Triangles & Word Problems

1. The length of a monument's shadow is 20.5m, when the length of Joan's shadow is 4.1m. If Joan is 1.2m tall, calculate the height of the monument.



2. To measure the width of a river the measurements shown were made by a surveyor. How will she determine the width of the river?



3. One triangle has two 50^{o} angles. Another triangle has a 50^{o} angle and an 80^{o} angle. Could the two triangles by similar? Explain.

NOTE: If two angles are equal in a triangle, then the triangles are similar!

4. At a certain time of day, a person who is 1.8 m tall has a shadow 1.3 m long. At the same time of day, the shadow of a totem pole is 6 m long. The sun's rays intersect the ground at equal angles. How tall is the totem pole, to the nearest tenth of a meter?

5. Using the diagram below:

   a. Which two triangles are similar? How do you know?

   b. If PQ = 8.2 cm, QS = 5.3 cm and ST = 7.3, what is the length of RS?