Similar Triangles **Name: _____**

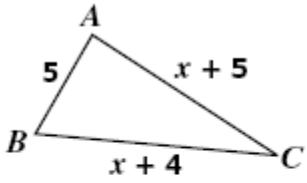
Similar figures have all corresponding angles congruent and all corresponding sides have the same scaling factor applied to them. If scaling factor (the ratio of two corresponding sides) is bigger than 1, then it is an expansion and if less than 1 then it is a reduction in size. If given a similarity statement, the order rules!

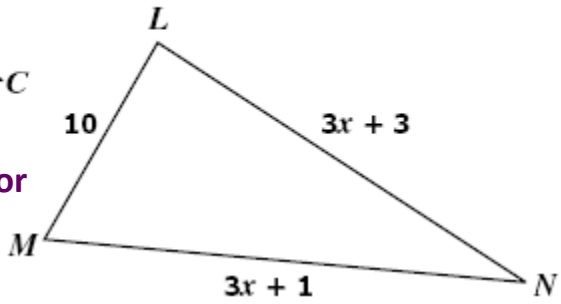
Like congruent triangles, similar triangles have some theorems to prove two triangles similar. Since all triangle's angles have to add to 180, then to have all three angles congruent, we need to find only two of the angles congruent. Sides have to have the same ratio (scaling factor).

Congruence	Similarity
SSS	SSS
SAS	SAS
ASA	AA
AAS	

SOL Example (of ORDER RULES):

Given ΔABC ~ ΔLMN
What is the length of AC ?





AB matches up with LM. This gives us a scaling factor of 5/10. Match either AC and LN or BC and MN

$$\frac{5}{10} = \frac{x+5}{3x+3} \quad \text{or} \quad \frac{5}{10} = \frac{x+4}{3x+1}$$

Either gives $x = 7$ and AC = 7

Similarity word problems usually are solved by the same steps.

1) **Find the correct proportion**
2) **Solve the proportion for the variable**

To find the correct proportion, we need to use like things in the ratios.

SOL Example (word problem):

A man is 6 feet tall casts a shadow that is 4 feet long. At the same time, a nearby flagpole casts a shadow that is 18 feet long. How tall is the flagpole?

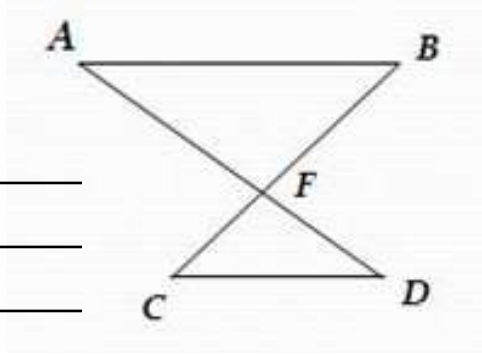
$$\begin{array}{r|c|c} & \text{Man} & \text{Flagpole} \\ \hline \text{Ht} & 6 & h \\ \hline \text{Shadow} & 4 & 18 \end{array}$$

or

$$\begin{array}{r|c|c} & \text{Ht} & \text{Shadow} \\ \hline \text{Man} & 6 & 4 \\ \hline \text{Flagpole} & h & 18 \end{array}$$

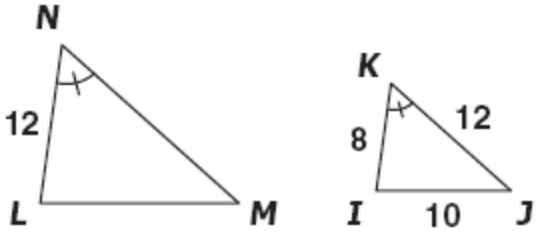
Either proportion gives the answer of h = 27 feet.

Given: AB // CD
Prove: ΔABF ~ ΔDCF

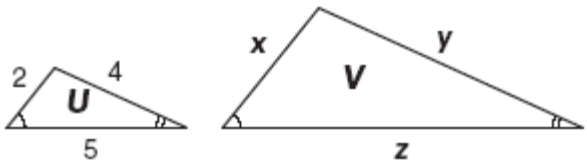


Statement	Reason

1. **What is NM, to prove ΔKJI ~ΔNML ?**

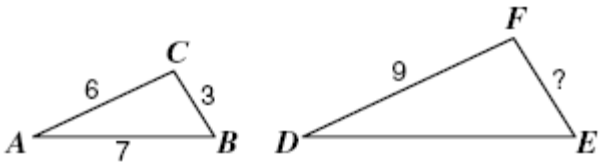


2. **The ratio of the perimeter of ΔU to the perimeter of ΔV is 1:3. If the triangles are similar, what if the value of x + y ?**

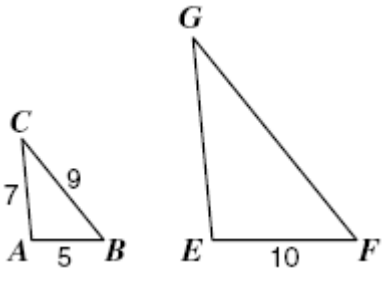


3. **A girl knows her height is 5 feet. At the time of the day when her shadow is 4 feet, a tree's shadow is 24 feet. What is the height of the tree?**

4. **Triangles ABC and DEF are similar and have the measurements as shown. What is the measure of EF?**



5. **Triangles ABC and EFG are similar with measurements as shown. What is the ratio of AC/EG ?**



6. **What is the perimeter of EFG?**