Geometry

Name _____

Date _____ Period _____

Chapter 8 Similarity

8.1 Similar Polygons

Corresponding Parts of Similar Polygons

Corresponding Angles $\angle A \cong \angle D, \angle B \cong \angle E, \angle C \cong \angle F$

Ratios of corresponding side lengths $\frac{DE}{AB} = \frac{EF}{BC} = \frac{FD}{CA} = k$ = scale factor

$\frac{kc}{c} = \frac{ka}{a} = \frac{kb}{b} = k$

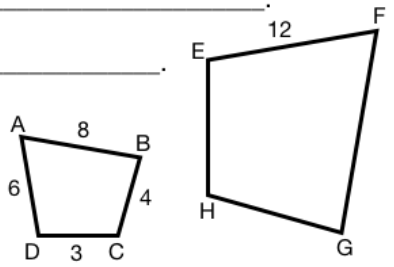
Using Similarity Statements

In the figures below, _____

(a) What is the _____?

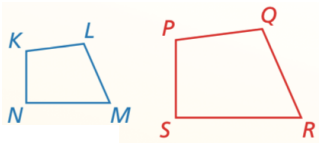
(b) List _____.

(c) List _____.



Perimeters of Similar Polygons Theorem	

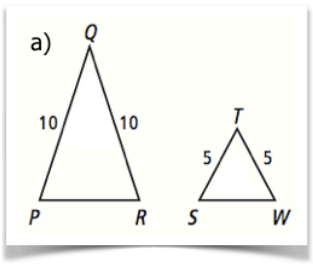
If KLMN ~ PQRS, then

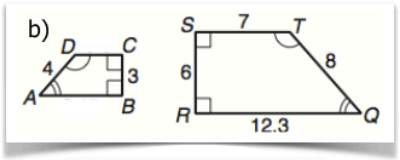


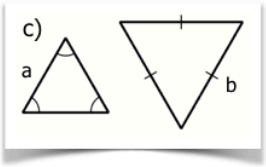
scale factor

Using Similarity Statements

In the figures below, determine which pairs are similar.







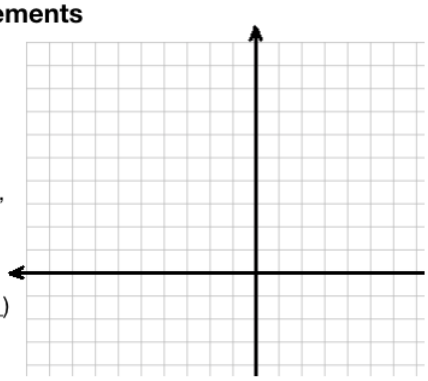
Using Similarity Statements

Given quadrilateral ABCD and segment A'B'. Find C' and D' so A'B'C'D' is similar to ABCD.

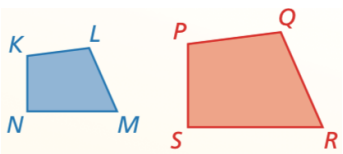
A(_____), B(_____),

C(_____), D(_____)

A'(_____), B'(_____)



Areas of Similar Polygons Theorem	



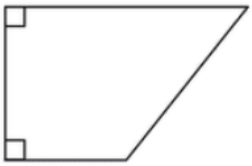
If $KLMN \sim PQRS$, then $\frac{\text{Area of } PQRS}{\text{Area of } KLMN} = \left(\frac{PQ}{KL}\right)^2 = \left(\frac{QR}{LM}\right)^2 = \left(\frac{RS}{MN}\right)^2 = \left(\frac{SP}{NK}\right)^2$

Using Similarity Statements

(a) Double the side lengths. Is the new figure similar?

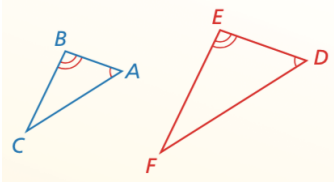
(b) Compare the perimeter of the original and new figure.

(c) Compare the areas.



8.2 Proving Triangle Similarity by AA~

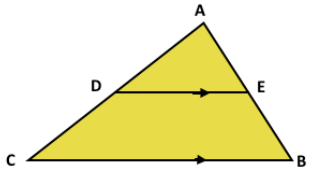
Angle-Angle Similarity (AA~) Theorem	



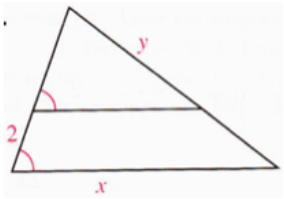
Using AA~

A) Are these triangles similar?

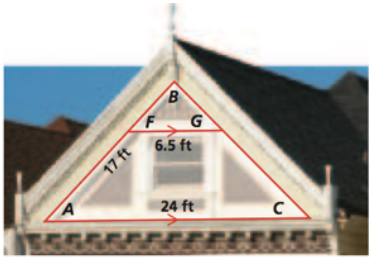
B) Are _____ and _____ similar? Why or why not?



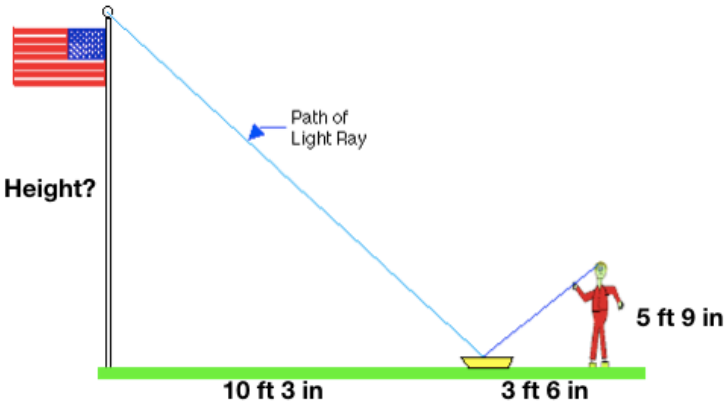
A) Calculate x and y.



B) Calculate the distance AB.

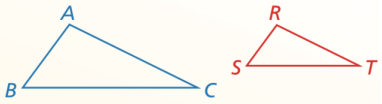


How are these triangles similar?



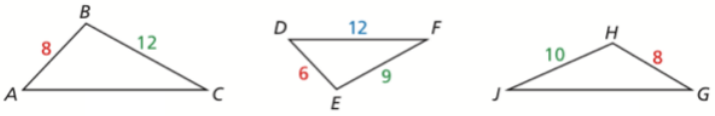
8.3 Proving Triangle Similarity by SSS and SAS

Side-Side-Side Similarity (SSS~) Theorem	



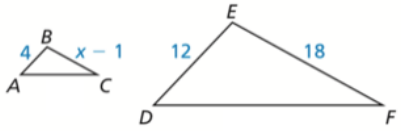
If $\frac{AB}{RS} = \frac{BC}{ST} = \frac{CA}{TR}$, then $\Delta ABC \sim \Delta RST$.

a) Which pairs of triangles are similar?

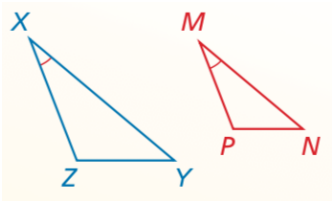


b) What value for x makes these triangles similar?

$\Delta ABC \sim \Delta DEF$

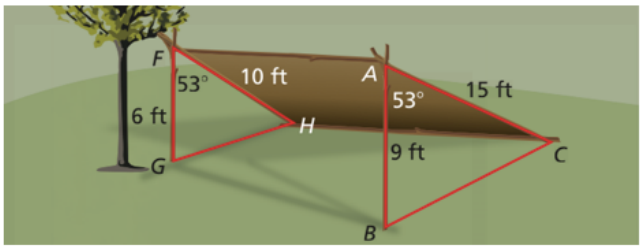


Side-Angle-Side Similarity (SAS~) Theorem	



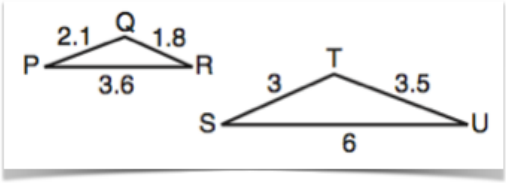
If $\angle X \cong \angle M$ and $\frac{ZX}{PM} = \frac{XY}{MN}$, then $\triangle XYZ \sim \triangle MNP$.

You built a lean-to shelter starting from a tree branch, as shown. Are the left and right ends similar?

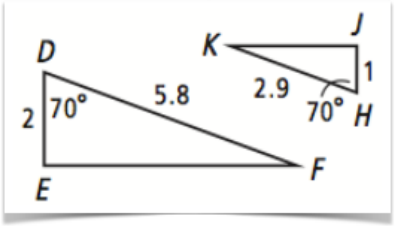


Verify the polygons are similar. Name the theorem, find the similarity ratio and similarity statement.

a)

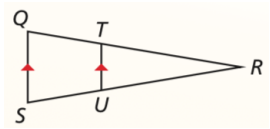


b)



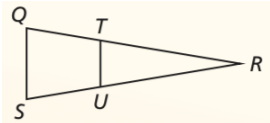
8.4 Proportionality Theorems

Triangle Proportionality Theorem	



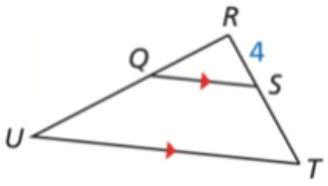
If $\overline{TU} \parallel \overline{QS}$, then $\frac{RT}{TQ} = \frac{RU}{US}$.

Converse of the Triangle Proportionality Theorem	

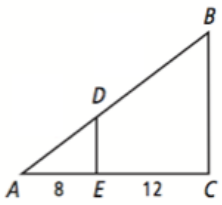


If $\frac{RT}{TQ} = \frac{RU}{US}$ then $\overline{TU} \parallel \overline{QS}$.

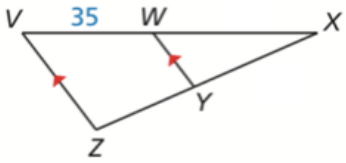
a) What is the length of QR?



b) Verify that $\overline{DE} \parallel \overline{BC}$.

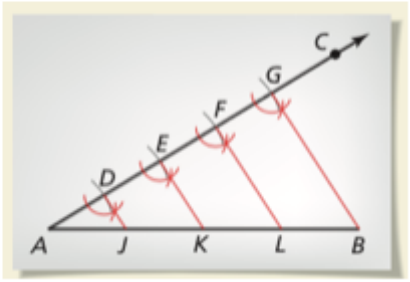


c) What is the length of YZ?

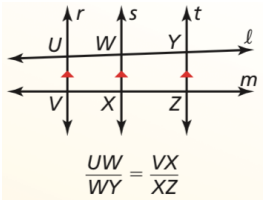


Triangle Proportionality

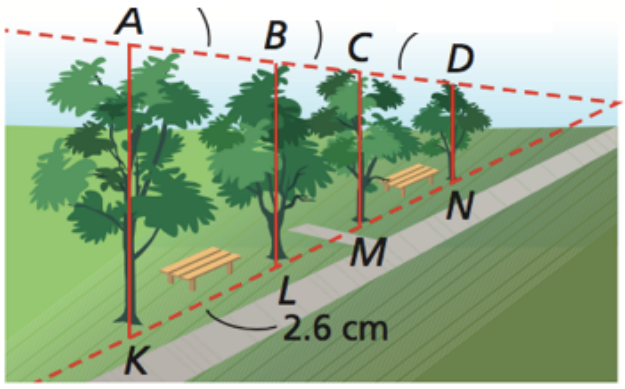
Find point L on AB in which AL is 3 times longer than LB.



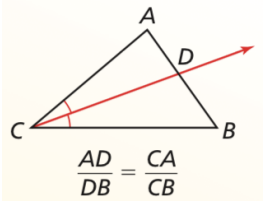
Three Parallel Lines Theorem	



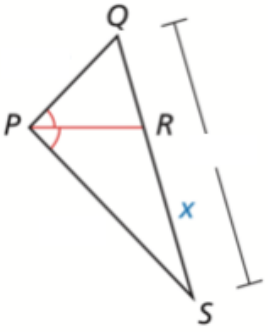
An artist used perspective to help her sketch a row of parallel trees. She then checked the drawing by measuring the distances between the trees. What is LN ?



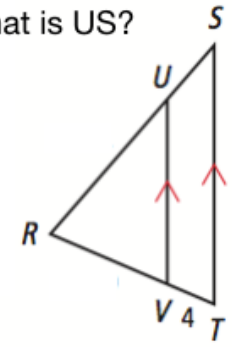
Triangle Angle Bisector Theorem	



a) What is the length of RS?



b) What is US?



c) What is PS and SR?