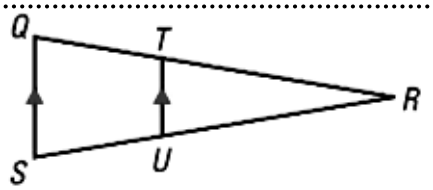
Proportions in Similar Triangles

Triangle Proportionality Theorem

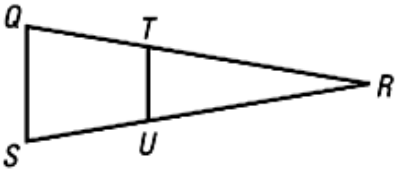
If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.



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

Converse of the Triangle Proportionality Theorem

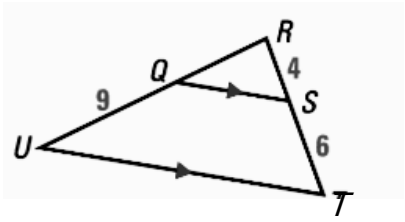
If a line divides two sides of a triangle proportionally, then it is parallel to the third side.



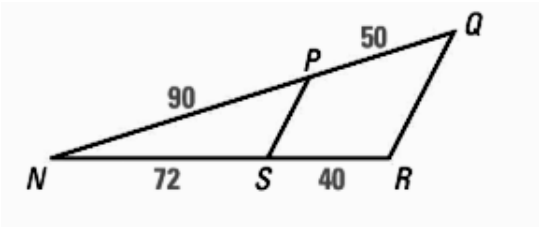
If $\frac{RT}{TQ} = \frac{RU}{US}$, then $\overline{TU} \parallel \overline{QS}$.

Practice Theorems 6.4-6.5:

1.) In the diagram, $\overline{QS} \parallel \overline{UT}$, RS = 4, ST = 6, and QU = 9. What is the length of $\overline{RQ}$?



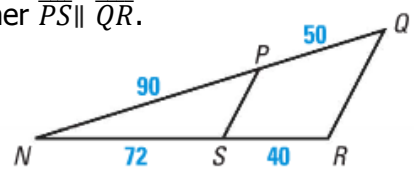
2.) Determine whether $\overline{PS} \parallel \overline{QR}$



On your Own:

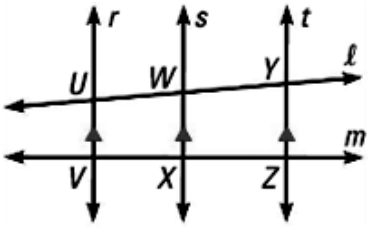
a. Find the length of $\overline{YZ}$.

b. Determine whether $\overline{PS} \parallel \overline{QR}$.



Side Splitter Proportionality

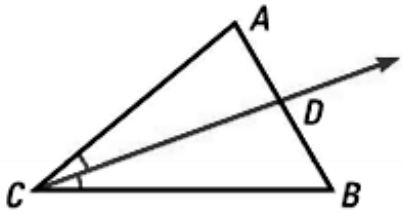
If three parallel lines intersect two transversals, then they divide the transversals proportionally.



$$\frac{UW}{WY} = \frac{VX}{XZ}$$

Angle Bisector Proportionality

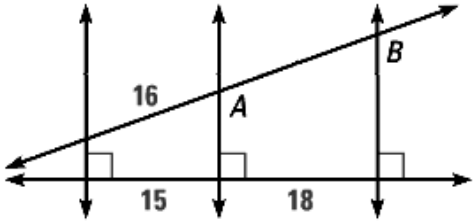
If a ray bisects an angle of a triangle, then it divides the opposite side into segments whose lengths are proportional to the lengths of the other two sides.



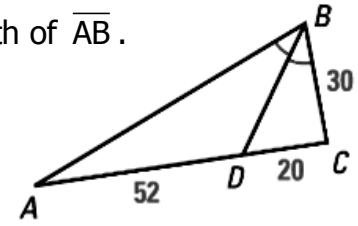
$$\frac{AD}{DB} = \frac{CA}{CB}$$

Practice with Proportionality:

3.) Find the length of $\overline{AB}$.

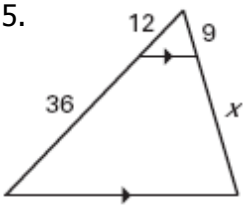


4.) Find the length of $\overline{AB}$.



Use the diagrams to find the value of each variable.

5.



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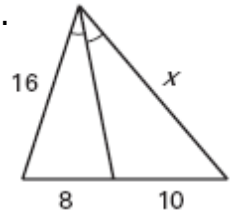

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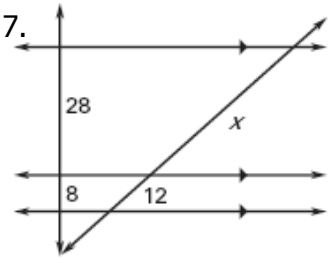

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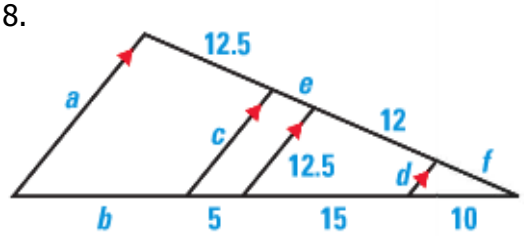
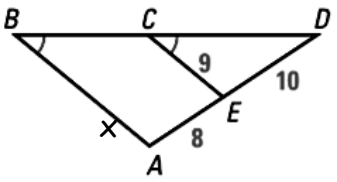


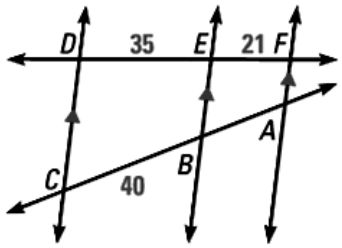
Mixed Practice

#9-13: Use the diagram to find the value of each variable.

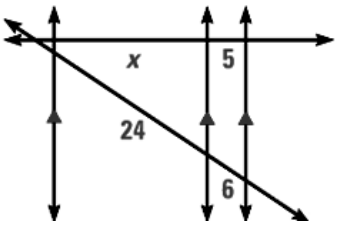
9.)



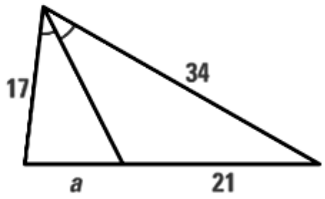
10.)



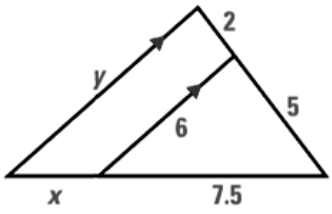
11.)



12.)



13.)



#14-17: Determine the length of each segment.

14.) $\overline{AG}$

15.) $\overline{FC}$

16.) $\overline{ED}$

17.) $\overline{AE}$