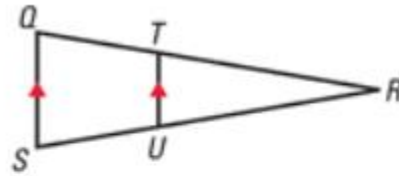


6.5 Use Proportionality Theorems

THEOREM 6.4 Triangle Proportionality Theorem

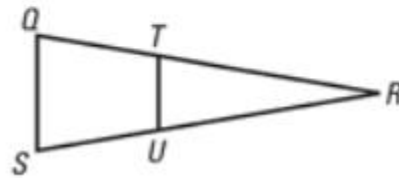
If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.



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

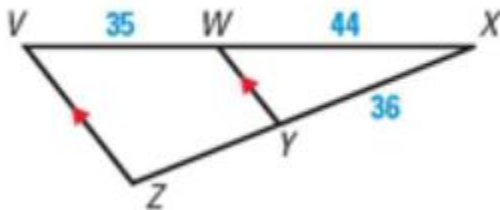
THEOREM 6.5 Converse of the Triangle Proportionality Theorem

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

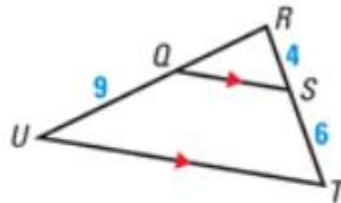


$$\text{If } \frac{RT}{TQ} = \frac{RU}{US}, \text{ then } \overline{TU} \parallel \overline{QS}.$$

1. Find the length of \overline{YZ} .



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



Solution

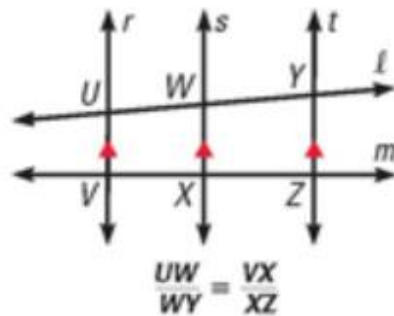
$$\frac{RQ}{QU} = \frac{RS}{ST} \quad \text{Triangle Proportionality Theorem}$$

$$\frac{RQ}{9} = \frac{4}{6} \quad \text{Substitute.}$$

$$RQ = 6 \quad \text{Multiply each side by 9 and simplify.}$$

THEOREM 6.6

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



THEOREM 6.7

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.

