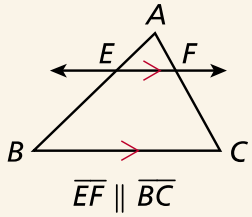
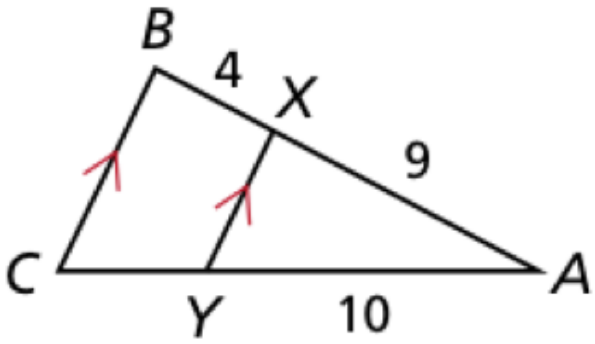
**Jadwin-Geometry-5A Period-Off Site Learning Packet Day 9**
**Applying Properties of Similar Triangles**

**Theorem 7-4-1** **Triangle Proportionality Theorem**

| THEOREM | HYPOTHESIS | CONCLUSION |
|---|---|---|
| If a line parallel to a side of a triangle intersects the other two sides, then it divides those sides proportionally. |   $\overline{EF} \parallel \overline{BC}$ | $\frac{AE}{EB} = \frac{AF}{FC}$ |

Example: Find $CY$.

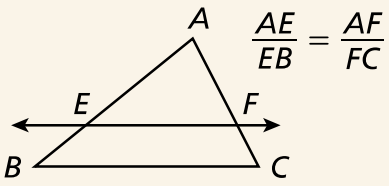



$\frac{4}{9} = \frac{CY}{10}$

$9CY = 40$

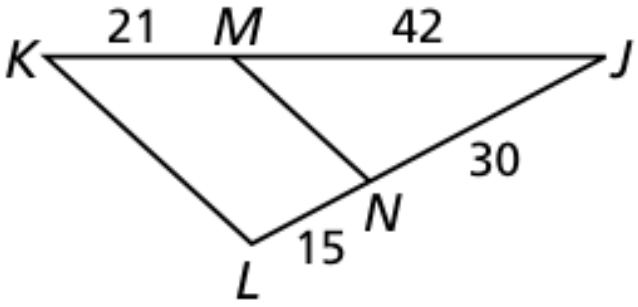
$CY = 4.\overline{4}$

**Theorem 7-4-2** Converse of the Triangle Proportionality Theorem

| THEOREM | HYPOTHESIS | CONCLUSION |
|---|---|---|
| If a line divides two sides of a triangle proportionally, then it is parallel to the third side. |  $\frac{AE}{EB} = \frac{AF}{FC}$ | $\overleftrightarrow{EF} \parallel \overline{BC}$ |



Example: Verify that $\overline{MN} \parallel \overline{KL}$.



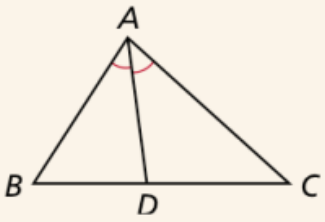


$\frac{KM}{MJ} = \frac{21}{42} = \frac{1}{2}$

$\frac{LN}{NJ} = \frac{15}{30} = \frac{1}{2}$

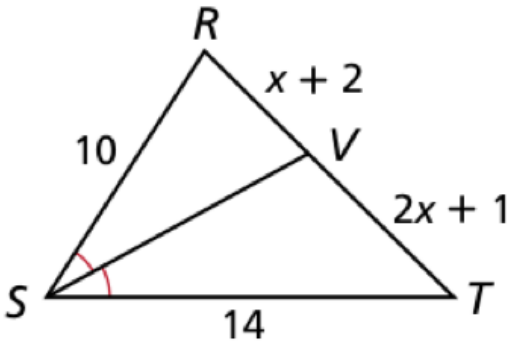
Since $\frac{KM}{MJ} = \frac{LN}{NJ}$, $\overline{MN} \parallel \overline{KL}$

**Theorem 7-4-4** Triangle Angle Bisector Theorem

| THEOREM | HYPOTHESIS | CONCLUSION |
|---|---|---|
| An angle bisector of a triangle divides the opposite side into two segments whose lengths are proportional to the lengths of the other two sides. (△ ∠ Bisector Thm.) |  | $\frac{BD}{DC} = \frac{AB}{AC}$ |



Example: Find RV and VT.





$\frac{RV}{VT} = \frac{RS}{ST}$

$\frac{x+2}{2x+1} = \frac{10}{14}$

$14x + 28 = 20x + 10$

$28 = 6x + 10$

$18 = 6x$

$3 = x$

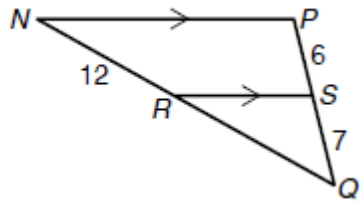
$RV = 3 + 2 = 5$

$VT = 2(3) + 1 = 7$

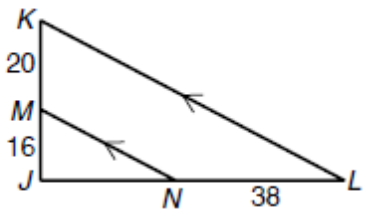
**Jadwin-Geometry-5A Period-Off Site Learning Packet Day 9**
**Applying Properties of Similar Triangles**

**Find the length of each segment.**

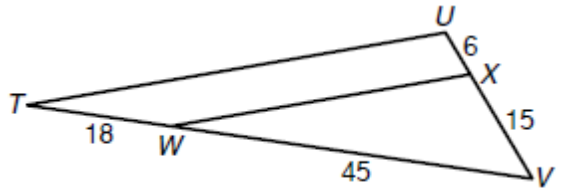
1. $\overline{RQ}$




2. $\overline{JN}$

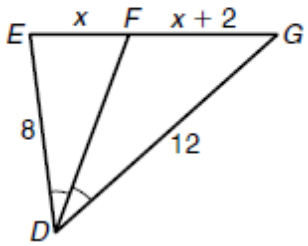



3. Show that $\overline{TU}$ and $\overline{WX}$ are parallel.




**Find the length of each segment.**

4. $\overline{EF}$ and $\overline{FG}$




5. $\overline{RV}$ and $\overline{TV}$