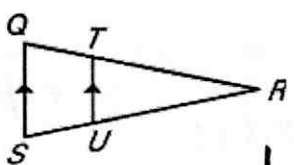
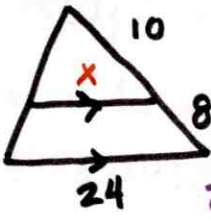
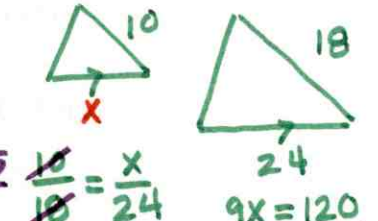
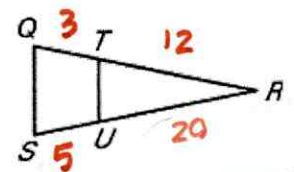
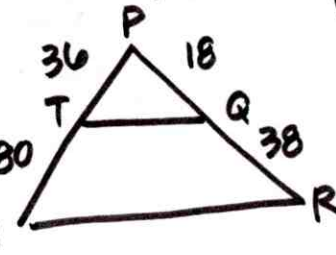


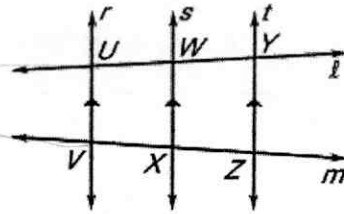
Use Proportionality Theorems

Vocabulary	Definition	Example
<p>THEOREM 6.4 TRIANGLE PROPORTIONALITY THEOREM</p> <p><math>\Delta</math> prop. Thm.</p>	<p>If a line parallel to one side of a triangle intersects the other two sides, then it divides the <u>two sides proportionally</u>.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>10 12 6</p> <p>x</p> <math display="block">\frac{10}{x} = \frac{12}{6}</math> <math display="block">2x = 10</math> <math display="block">x = 5</math> </div> <div style="text-align: center;"> <p>If <math>\overline{TU} \parallel \overline{QS}</math>, then <math>\frac{RT}{TQ} = \frac{RU}{US}</math>.</p>  <p>10 8 24</p> <p>x</p> <math display="block">\frac{5}{9} = \frac{x}{24}</math> <math display="block">x = \frac{40}{3}</math> </div> <div style="text-align: center;">  <p>10 18 24</p> <p>x</p> <math display="block">\frac{9x}{24} = \frac{10}{24}</math> <math display="block">9x = 120</math> <math display="block">x = 120/9</math> <math display="block">x = \frac{40}{3}</math> </div> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>#1 MISTAKE!!!!!!!</p> <p><math>\frac{10}{8} = \frac{x}{24}</math> NO!!!</p> <p><math>\frac{\Delta}{\square}</math> NOT TRUE</p> </div>
<p>THEOREM 6.5 CONVERSE of the TRIANGLE PROPORTIONALITY THEOREM</p> <p>C<math>\Delta</math> Prop. Thm.</p>	<p>If a line divides two sides of a triangle proportionally, then it is parallel to the <u>third side</u>.</p>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>3 12 5 20</p> <p>x</p> <p>IS <math>\overline{QT} \parallel \overline{RS}</math>?</p>  <p>36 18 80 38</p> <p>x</p> </div> <div style="text-align: center;"> <p>If <math>\frac{RT}{TQ} = \frac{RU}{US}</math>, then <math>\overline{TU} \parallel \overline{QS}</math>.</p> <math display="block">\frac{12}{3} = \frac{20}{5}</math> <math display="block">\frac{4}{1} = \frac{4}{1} \checkmark</math> <math display="block">\frac{PT}{TS} = \frac{PQ}{QR} \rightarrow \frac{36}{80} = \frac{18}{38}</math> <math display="block">\frac{9}{20} = \frac{9}{19}</math> <p>(NO)</p> </div> </div>

THEOREM 6.6

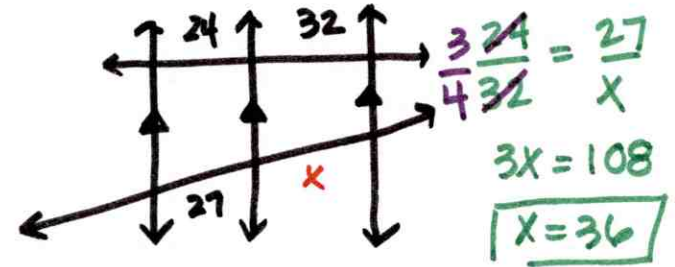
If three parallel lines intersect two transversals, then they divide the transversals proportionally

Line  $l$  and  $m$  are transversals.



$$r \parallel s \parallel t$$

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



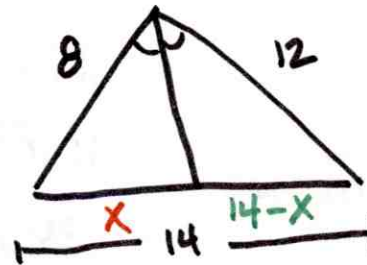
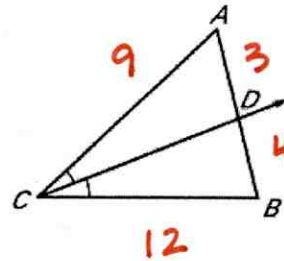
$$\frac{3 \cdot 24}{4 \cdot 32} = \frac{27}{x}$$

$$3x = 108$$

$$x = 36$$

THEOREM 6.7

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



$$\frac{AD}{AC} = \frac{BD}{BC}$$

$$\frac{x}{8} = \frac{14-x}{12}$$

$$12x = 8(14-x)$$

$$12x = 112 - 8x$$

$$20x = 112$$

$$x = \frac{112}{20}$$

$$x = \frac{28}{5}$$