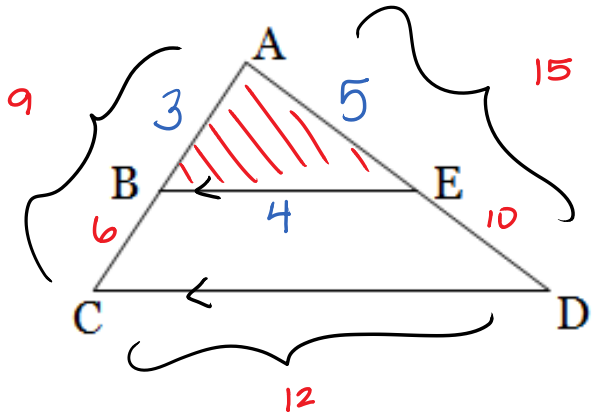
Geometry G
Block

7.4 Applying Properties of Similar Triangles

- Side Splitter Theorem



$\frac{5}{15} = \frac{3}{9} = \frac{4}{12}$

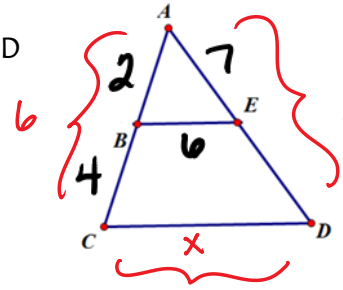
$\frac{1}{3} = \frac{1}{3} = \frac{1}{3}$ ✓

$\frac{3}{6} = \frac{5}{10} \neq \frac{4}{12}$ careful!

$\frac{1}{2} = \frac{1}{2} \neq \frac{1}{3}$

Example 1: Given: BE ll CD

Find: CD



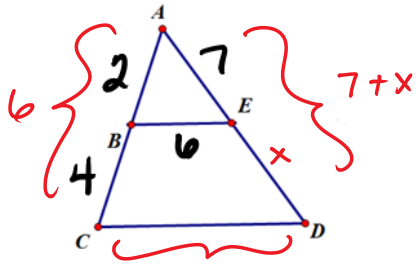
$\frac{2}{6} = \frac{6}{x}$

$2x = 36$

$x = 18$

Example 2: Given BE || CD

Find: ED



$\frac{2}{6} = \frac{7}{7+x}$

$2(7+x) = 42$

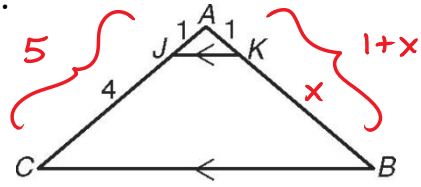
$14 + 2x = 42$

$2x = 28$

$\boxed{x = 14}$

Example 3: Given JK || CB.

Find KB.



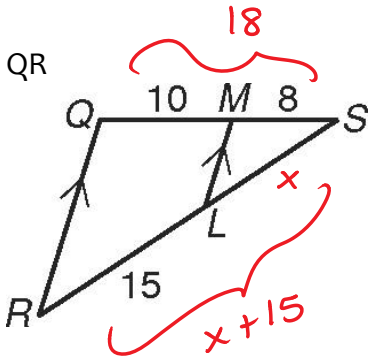
$\frac{1}{5} = \frac{1}{1+x}$

$1 + x = 5$

$\boxed{x = 4}$

Example 4: Given ML || QR

Find LS.



$\frac{8}{18} = \frac{x}{x+15}$

$8(x+15) = 18x$

$8x + 120 = 18x$

$120 = 10x$

$\boxed{x = 12}$

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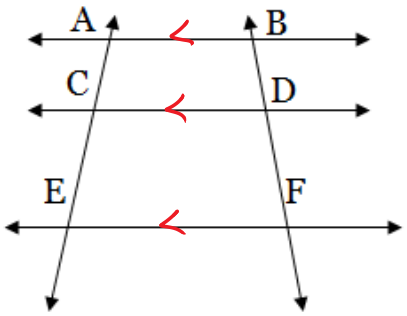
☐ **Two Transversal Proportionality Theorem**



if $\overline{AB} \parallel \overline{CD} \parallel \overline{EF}$

then $\frac{AC}{CE} = \frac{BD}{DF}$ and $\frac{AC}{BD} = \frac{CE}{DF}$

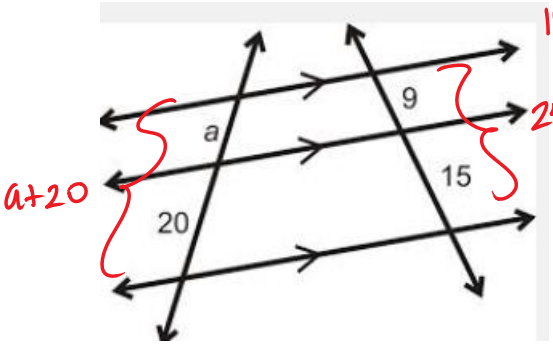
Example 1: Given: l ll m ll n

Find: a

$\frac{a}{20} = \frac{9}{15}$

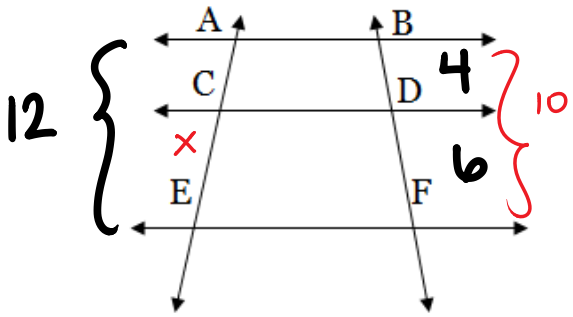
$15a = 180$

$a = 12$



Example 2: Given AB || CD || EF

Find: CE

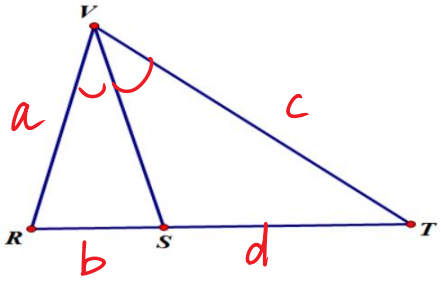


$\frac{x}{12} = \frac{6}{10}$

$10x = 72$

$x = 7.2$

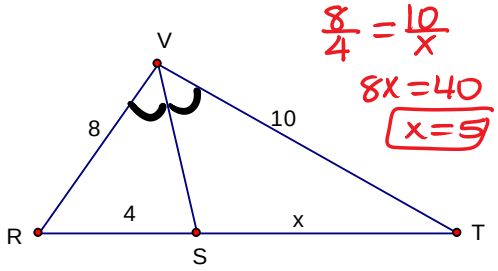
☐ **Angle Bisector Theorem**



$\frac{a}{b} = \frac{c}{d}$

Example 1: Given $\angle RVS \cong \angle SVT$

Find ST.



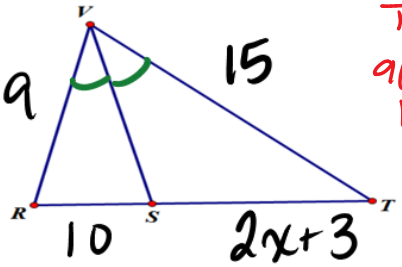
$\frac{8}{4} = \frac{10}{x}$

$8x = 40$

$x = 5$

Example 2: Given $\angle RVS \cong \angle SVT$

Find x.



$\frac{9}{10} = \frac{15}{2x+3}$

$9(2x+3) = 150$

$18x + 27 = 150$

$18x = 123$

$x = 6.83$