Math 1312
Section 5.6
Segments Divided Proportionally

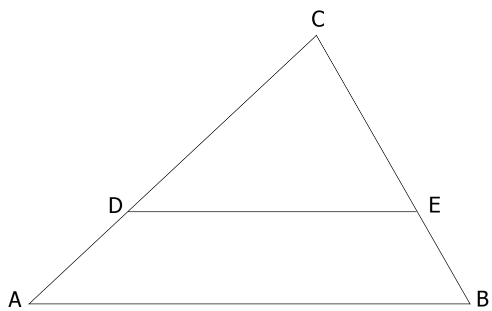
Property 1: If $\frac{a}{b} = \frac{c}{d}$, then $\frac{a+c}{b+d} = \frac{a}{b} = \frac{c}{d}$

Example 1: If $\frac{1}{5} = \frac{2}{10}$, then (finish using Property 1).

Property 2 (from 5.1): If $\frac{a}{b} = \frac{c}{d}$ ($b \neq 0$ and $d \neq 0$), then $\frac{a+b}{b} = \frac{c+d}{d}$ and $\frac{a-b}{b} = \frac{c-d}{d}$.

Theorem1: If a line is parallel to one side of a triangle and intersects the other two sides, then it divides these sides proportionally.

Example 2: If we are given ΔABC and ΔDEC, where $\overline{DE} \parallel \overline{AB}$, then $\frac{CA}{CD} = \frac{CB}{CE}$.

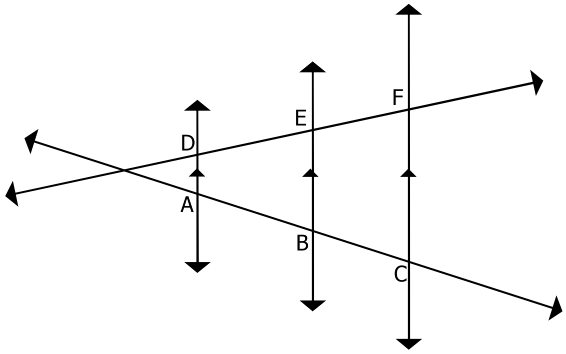


Corollary 1: If three or more parallel lines intersect two transversals, then they cut off the transversals proportionally.

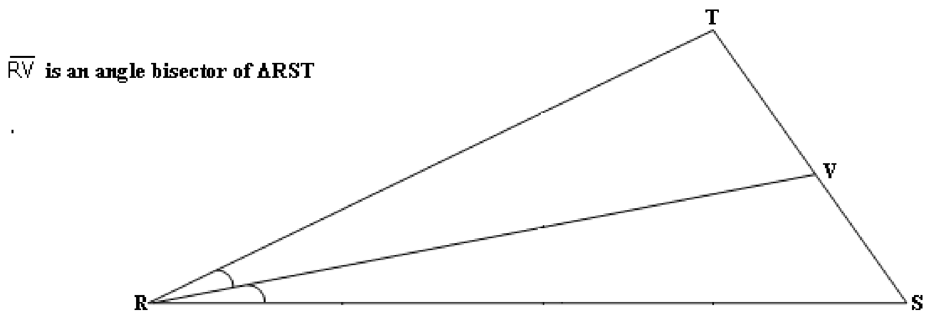
Corollary 2: If three or more parallel lines cut off congruent segments on one transversal, then they cut off congruent segments on every transversal.

Example 3: Given the figure below, by the above rule: $\frac{AB}{BC} = \frac{DE}{EF}$, $\frac{AC}{DF} = \frac{BC}{EF}$.

Write more proportions.



Angle Bisector Theorem: If a ray bisects one angle of a triangle then it divides the **opposite side** into segments whose lengths are proportional to the lengths of the two sides that form the bisected angle.



So, $\frac{TV}{RT} = \frac{VS}{RS}$ or $\frac{RT}{TV} = \frac{RS}{SV}$ or $\frac{RT}{RS} = \frac{TV}{SV}$

We will work #11, 13, and 17 from section 5.6