

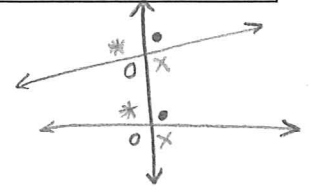
Section 6.6: Use Proportionality Theorems

Essential Question: What proportion can you write if a line is parallel to one side of a triangle?

VOCABULARY:

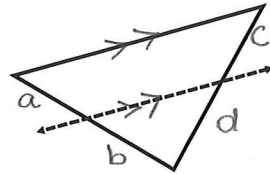
Corresponding Angles

Two angles that are both above or below a transversal and both to the right or left



Theorem 6.4: Triangle Proportionality Theorem

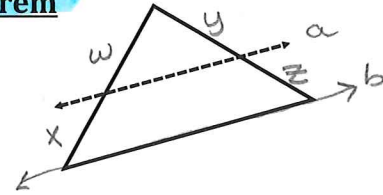
If a line parallel to one side of a triangle intersects the other two sides, then it divides the two sides proportionally.



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

Theorem 6.5: Converse of the Triangle Proportionality Theorem

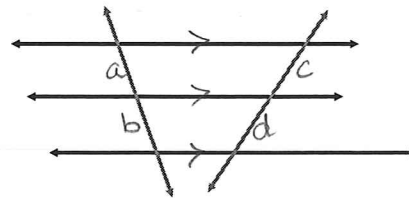
If a line divides 2 sides of a triangle proportionally, then it is parallel to the third side.



If $\frac{w}{x} = \frac{y}{z}$, then $a \parallel b$.

Theorem 6.6

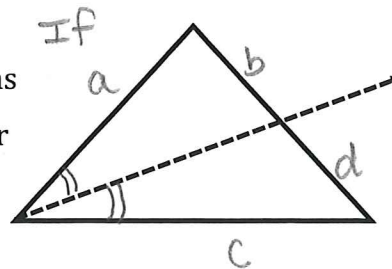
If three parallel lines intersect two transversals, then they divide the transversals proportionally.



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

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.



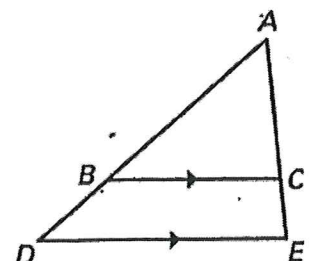
then $\frac{a}{b} = \frac{c}{d}$
OR $\frac{a}{c} = \frac{b}{d}$

EXAMPLES:

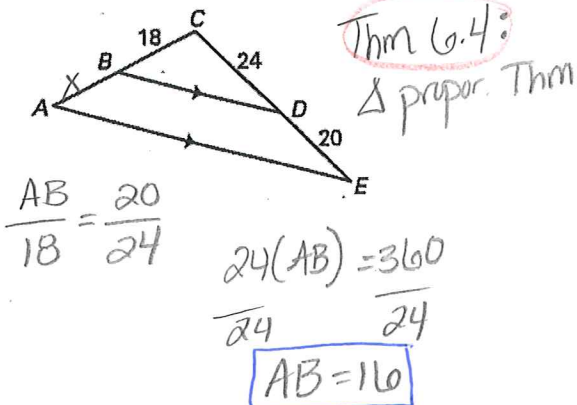
A1. Write two true proportions using the figure.

$\overline{BC} \parallel \overline{DE} \rightarrow \Delta$ propor. Thm

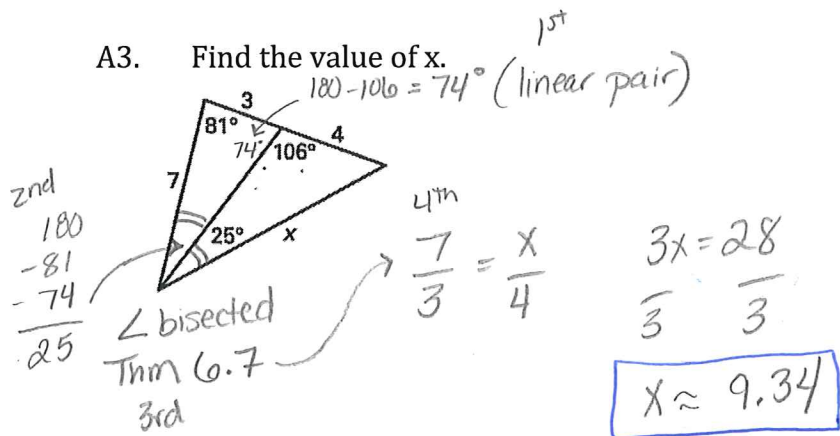
$\frac{AB}{BD} = \frac{AC}{CE}$ OR $\frac{AB}{AC} = \frac{BD}{CE}$



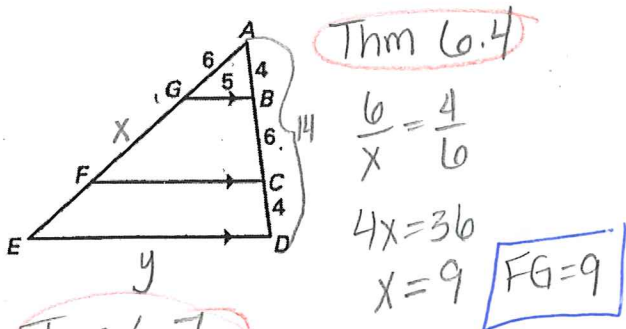
A2. Find the length of \overline{AB} .



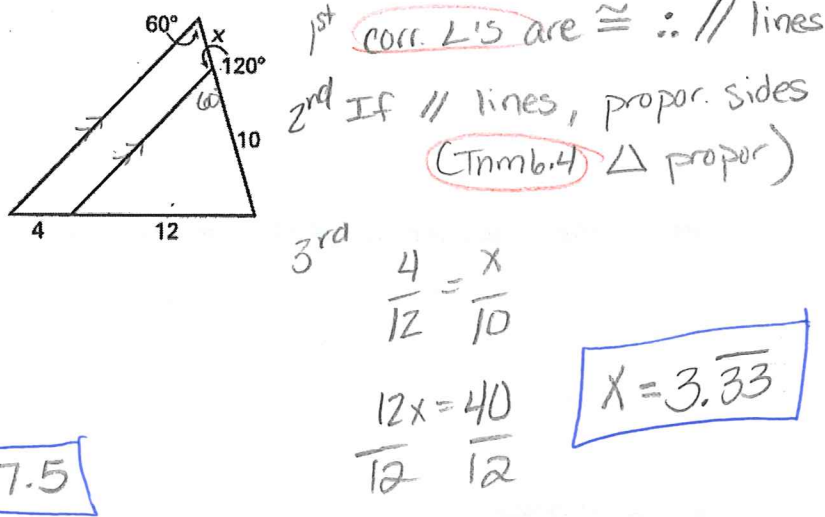
A3. Find the value of x.



A4. Find the length of \overline{FG} and \overline{ED} .



A5. Find the value of x.



Thm 6.7

$$\frac{AB}{GB} = \frac{AD}{ED} \rightarrow \frac{4}{5} = \frac{14}{y}$$

$$\frac{4y}{4} = \frac{70}{4}$$

$$y = \boxed{ED = 17.5}$$

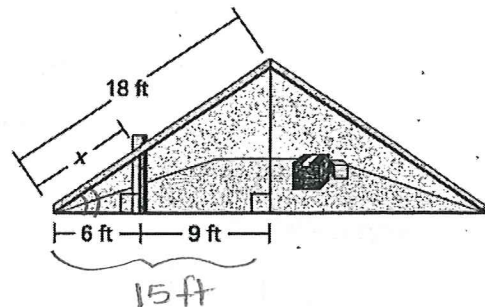
A6. The cross section of a house attic is showing the vent pipe being 6 feet from the edge of the house. Find the value of x.

Δ 's are similar by AA \sim
 (rt Δ 's and share an angle)

$$\frac{6}{x} = \frac{15}{18}$$

$$15x = 108$$

$$\boxed{x = 7.2 \text{ ft}}$$



Section 6.6 Summary:

If a line is \parallel to one side of a Δ , then it creates segments that are proportional.



$$\frac{a}{b} = \frac{c}{d} \quad \text{OR} \quad \frac{a}{c} = \frac{b}{d}$$