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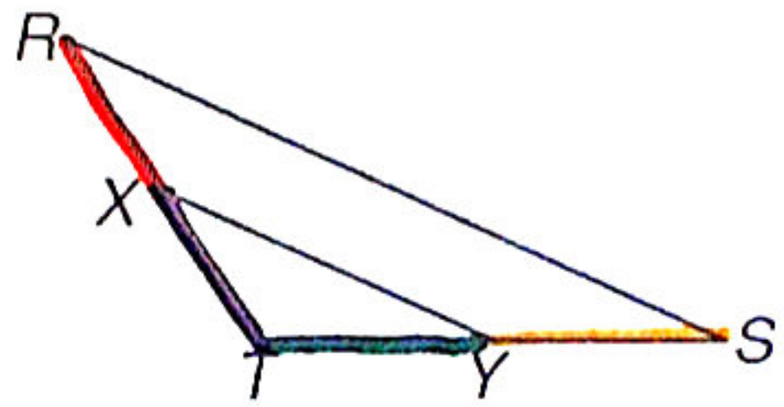
Triangle Similarity & Congruence 7.3 (Proportional Segments between Parallel Lines)

Content Objective: I will be able to determine proportional segments within triangles
Language Objective: I will be able to solve problems using proportional segments with parallel lines
Question: What evidence is needed to prove that triangles are similar?

Study Question(s)

Triangle Proportionality Theorem

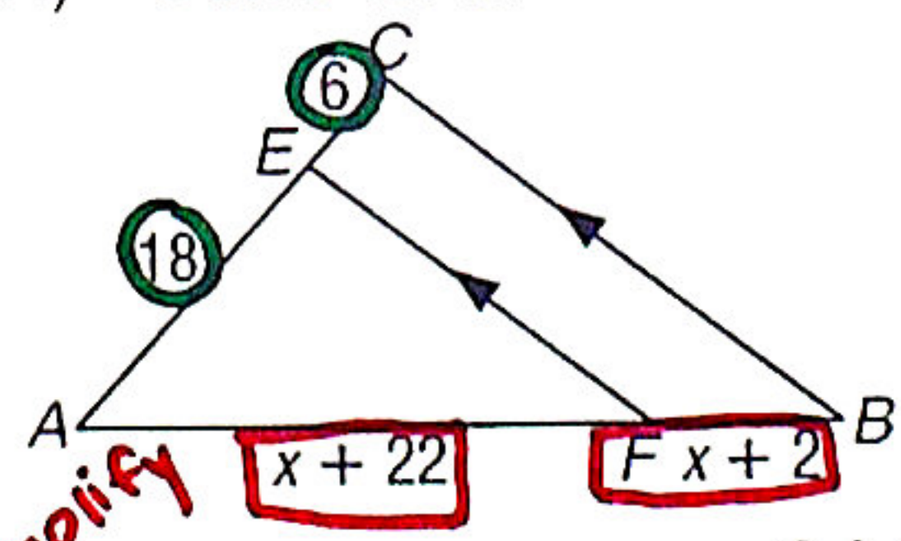
If a line is parallel to one side of a triangle and interests the other two sides, then it separates these sides into segments of proportional lengths.



$$\frac{RX}{XT} = \frac{SY}{YT}$$

Ex #1

A) Solve for x.



Simplify

$$\frac{18}{6} = \frac{x+22}{x+2}$$

$$\frac{3}{1} = \frac{x+22}{x+2}$$

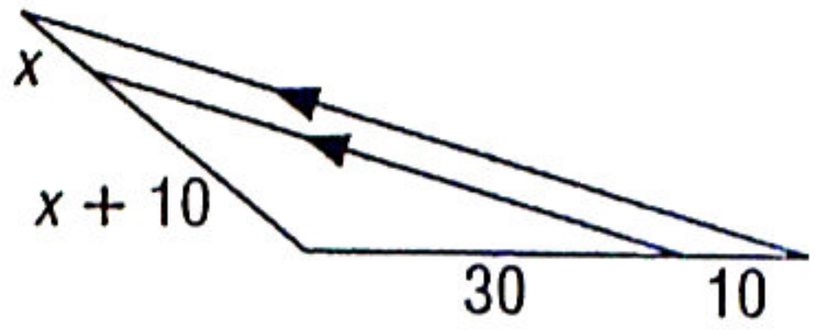
$$3(x+2) = 1(x+22)$$
$$3x+6 = x+22$$
$$2x+6 = 22$$
$$2x = 16$$
$$\boxed{x = 8}$$

* Note: There are multiple ways of setting up your proportion. This is just one way.

Summary

Example 1 (continued)

B) Solve for x.



$$\frac{x}{x+10} = \frac{10}{30}$$

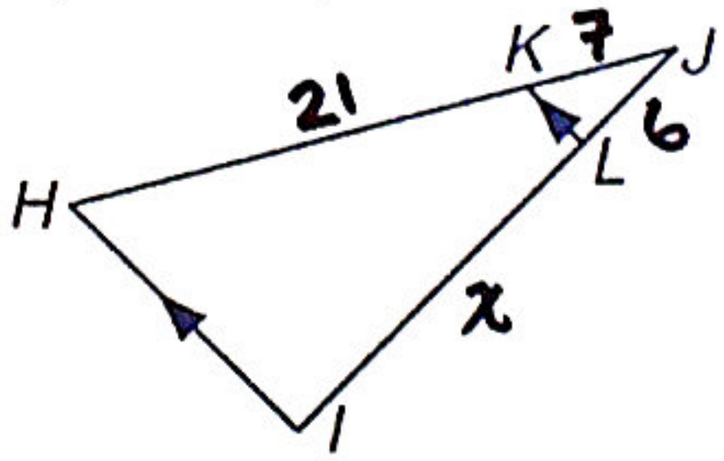
$$\frac{x}{x+10} \times \frac{1}{3}$$

$$3x = x + 10$$

$$2x = 10$$

$$\boxed{x = 5}$$

C) JK=7, KH=21, JL=6. Solve for LI.



$$\frac{3}{1} \frac{21}{7} \times \frac{x}{6}$$

$$x = 18$$

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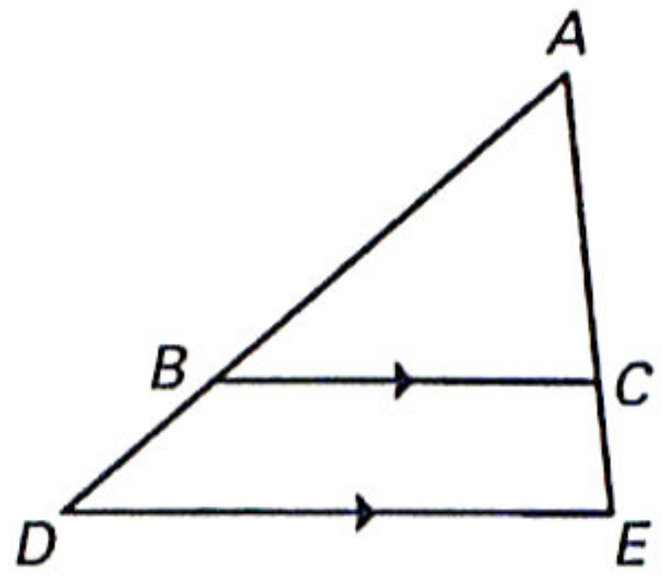
Example 2



Complete the proportion.

A) $\frac{AC}{CE} = \frac{AB}{BD}$

B) $\frac{AC}{AE} = \frac{AB}{AD}$

C) $\frac{AC}{BC} = \frac{AE}{DE}$