

**6C – Applying Theorems**

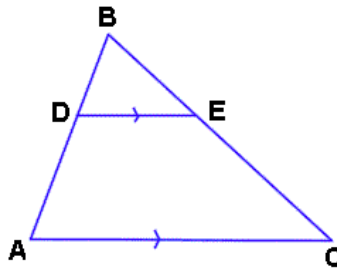
❖ Vocabulary, Formulas, Theories:

- **Similar Figures:** figures that are the same shape but not necessarily the same size.
- **Scale Factor:** the ratio of corresponding sides of similar figures.

- **Side Splitter Theorem:** If a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.

If:  $\overline{DE} \parallel \overline{AC}$

Then:  $\frac{BD}{DA} = \frac{BE}{EC}$

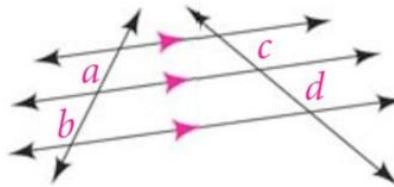


Many problems involving similar triangles have one triangle **ON TOP OF** (overlapping) another triangle. Since  $\overline{DE}$  is marked to be parallel to  $\overline{AC}$ , we know that we have  $\angle BDE$  congruent to  $\angle DAC$  (by corresponding angles).  $\angle B$  is shared by both triangles, so the two triangles are similar by AA.

- **Corollary to the Side Splitter Theorem:** If three (or more) parallel lines intersect two transversals, then the segments intercepted on the transversals are proportional.

If: 3 (or more) lines are  $\parallel$

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

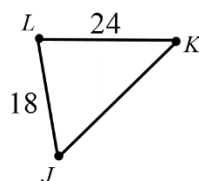
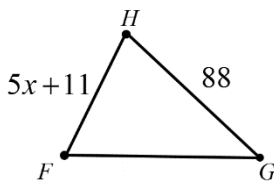


📺 Video - "[Similarity - Finding Unknown Values - Example 1](#)" - MathontheWeb (7:44)

EX1) The given triangles are similar. Determine the value of the unknown variables.

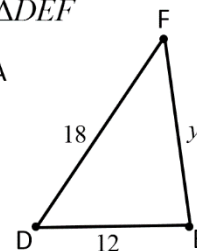
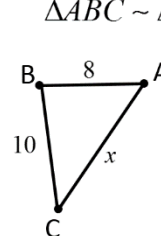
a)

$\triangle FGH \sim \triangle JKL$



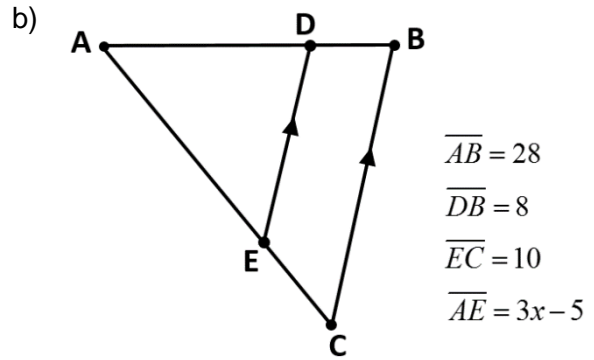
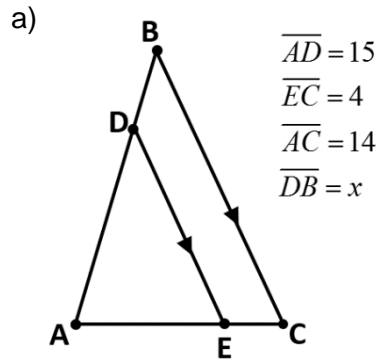
b)

$\triangle ABC \sim \triangle DEF$



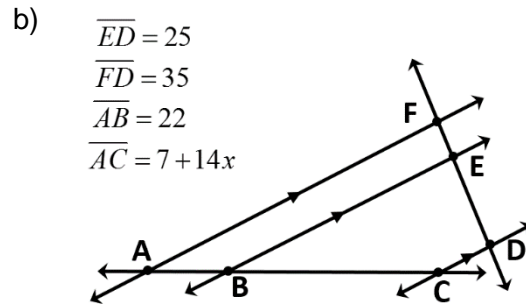
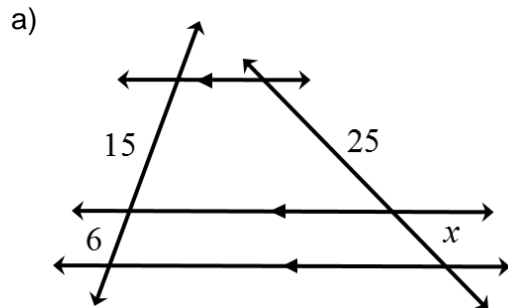
Video - "Similarity - Finding Unknown Values - Example 2" - MathontheWeb (6:52)

EX2) Determine the value of the known variables.



Video - "Similarity - Finding Unknown Values - Example 3" - MathontheWeb (5:54)

EX3) Determine the value of the unknown variables.



Video - "Similarity - Finding Unknown Values - Example 4" - MathontheWeb (9:45)

EX4) Maritza stands next to her cottage and measures her shadow and the cottage's shadow. Her shadow is 8 feet long and the cottage's shadow is 48 feet long. Maritza is standing at a height of 6 feet. Draw a diagram and calculate the height of her cottage.

EX5) Jack stands at a height of 1.3 meters. He is 7 meters in front of a post and casts a shadow 1.8 meters long. Draw a diagram and calculate the height of the post.