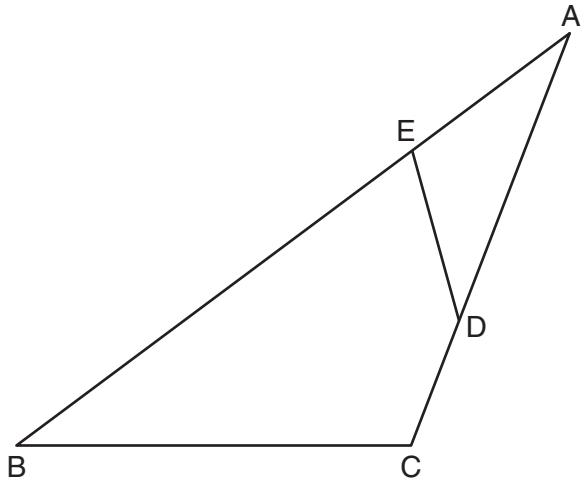
BECA / Dr. Huson / Geometry 7-Similarity Name:
9 February 2022
Challenge: Similar triangles

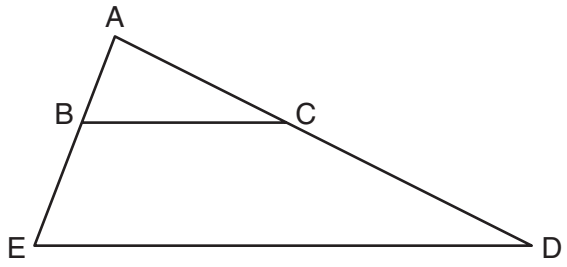
1.

The diagram below shows $\triangle ABC$, with $\overline{AEB}$, $\overline{ADC}$, and $\angle ACB \cong \angle AED$.
Write down what triangles are similar. How would you prove it? Try to write a proof.



2.

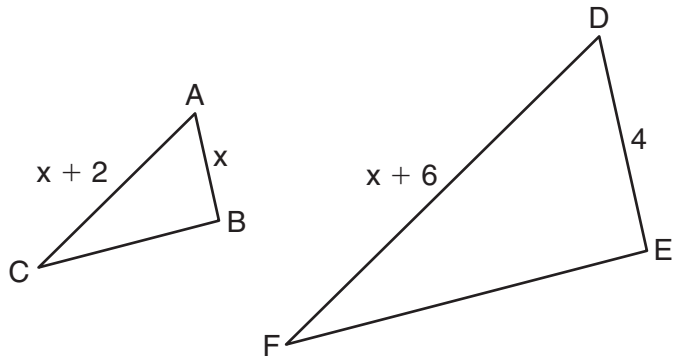
In the diagram below of $\triangle ADE$, B is a point on $\overline{AE}$ and C is a point on $\overline{AD}$ such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length of $\overline{AC}$.



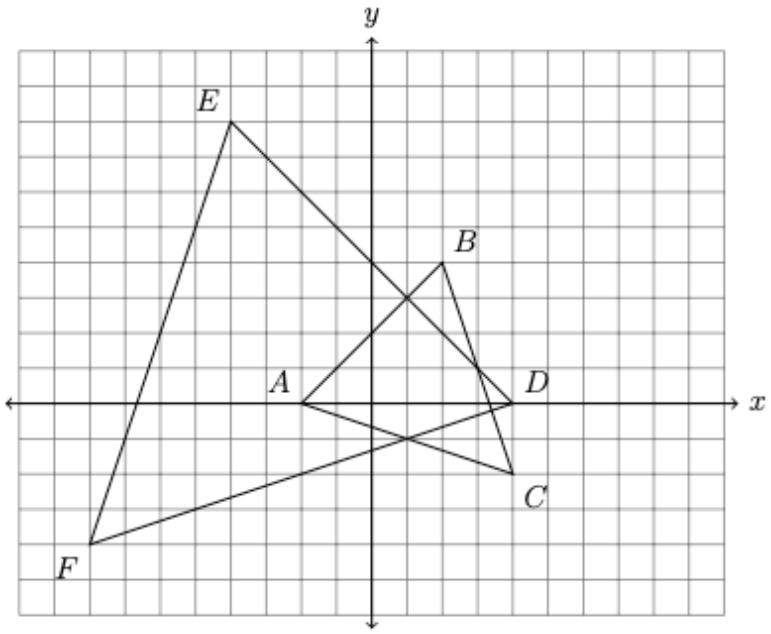
3. Explain this mathematics using words and algebraic symbols:
The father's will bequeaths his 17 camels to his sons in the following proportions: 1/2 to the oldest, 1/3 to the middle, 1/9 to the youngest. To enact the division, a passerby temporarily donates his one camel, making 18. They are allocated 9, 6, & 2 camels, with one remaining for this stranger.

4.

In the diagram below, $\triangle ABC \sim \triangle DEF$, $DE = 4$, $AB = x$, $AC = x + 2$, and $DF = x + 6$. Determine the length of $\overline{AB}$. [Only an algebraic solution can receive full credit.]



5. *Spicy* On the set of axes below, $\triangle ABC$ has vertices at $A(-2, 0)$, $B(2, 4)$, $C(4, -2)$, and $\triangle DEF$ has vertices at $D(4, 0)$, $E(-4, 8)$, $F(-8, -4)$.



Which tranformations map $\triangle ABC \to \triangle DEF$? Mark each statement True or False

(a) A dilation with a scale factor of -2 centered at the origin True False

(b) A dilation with a scale factor of $\frac{1}{2}$ centered at point A True False

(c) A dilation with a scale factor of 2 centered at the origin, followed by a rotation of $180°$ about the origin True False

(d) A dilation with a scale factor of 2 centered at the origin, followed by a reflection across the y-axis True False