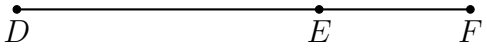
BECA/Huson/Geometry: Similarity
6 December 2024

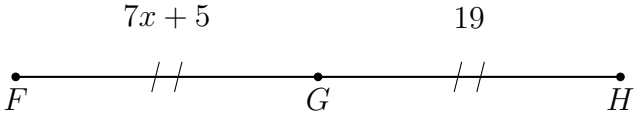
First and last name:
Section:

3.18 Test: Dilation and similarity

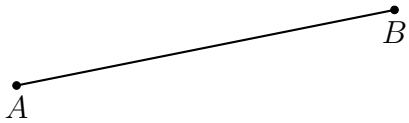
1. Given $\overline{DEF}$, $DE = 11\frac{1}{4}$, and $EF = 4$. Find DF.



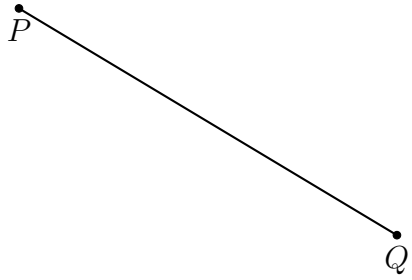
2. Point G bisects $\overline{FH}$, with $FG = 7x + 5$, $GH = 19$. Find x.



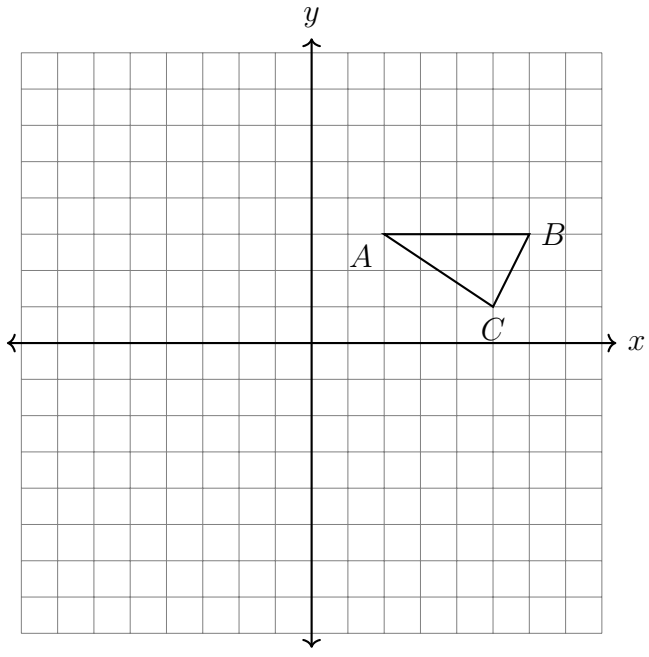
3. Construct an equilateral triangle with one side $\overline{AB}$.



4. Construct a perpendicular bisector of $\overline{PQ}$.



5. Apply a clockwise rotation of 90° centered at the origin to $\triangle ABC$. Plot and label the image on the axes below.



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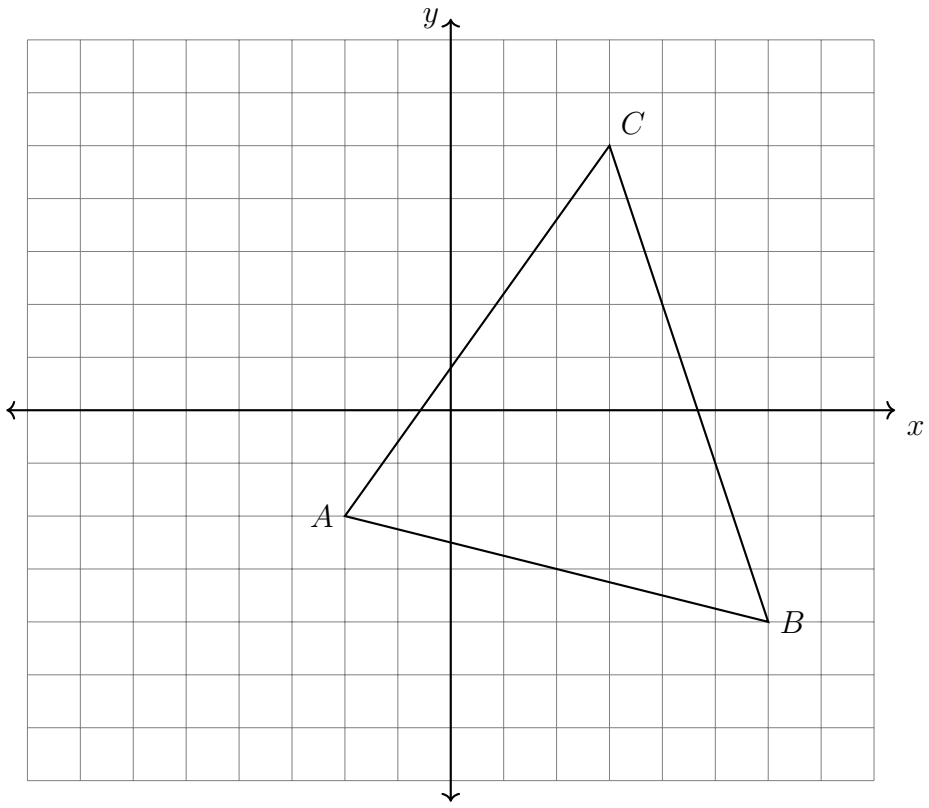
6. Reflect $\triangle ABC$ across the y-axis. Label the image $\triangle A'B'C'$ on the graph.



7. A translation is applied to $\triangle ABC$ moving it to the up 5 and right 1.
   (a) Write as coordinate pairs the vertices of the image, $\triangle A'B'C'$

   $A(2, 0) \rightarrow$

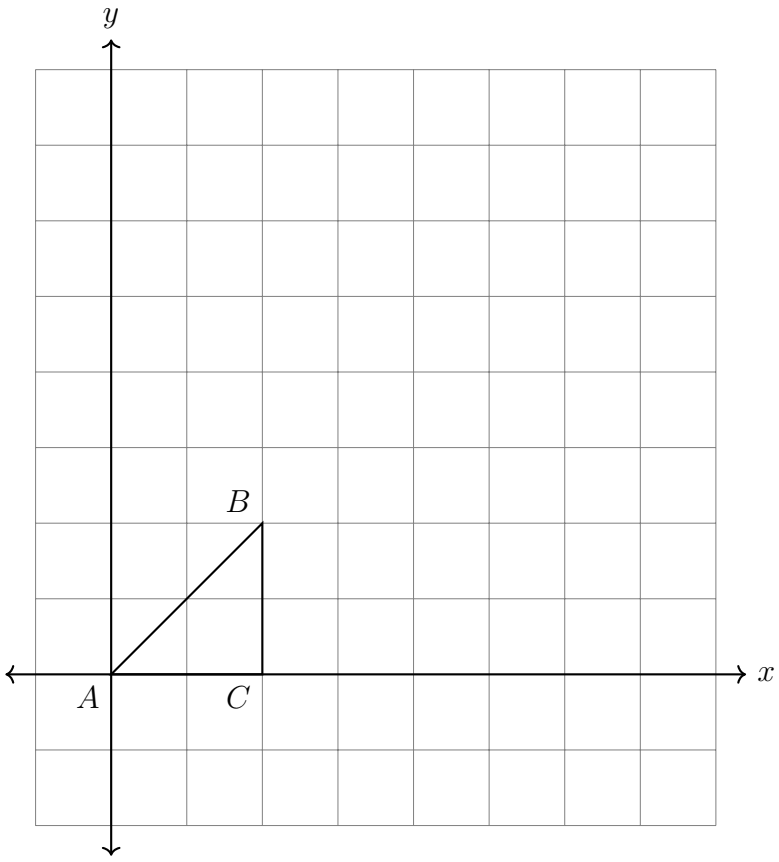
   $B(-5, -3) \rightarrow$

   $C(-2, 2) \rightarrow$

   (b) Which triangle is larger, or are they the same size? Justify your answer.

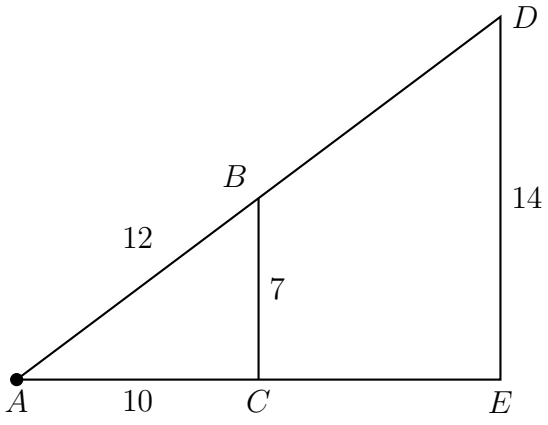
8. A translation maps $D(2, 3) \rightarrow D'(-3, 3)$. What is the image of $E(4, -1)$ under the same translation?

9. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 3$ centered at the origin, $(x, y) \to (3x, 3y)$. Plot and label the image on the axes.



10. A dilation centered at A with scale factor $k = 2$ maps $\triangle ABC \to \triangle ADE$. Given the lengths $AC = 10$, $BC = 7$, $AB = 12$, and $DE = 14$.

    How long are AD and AE?



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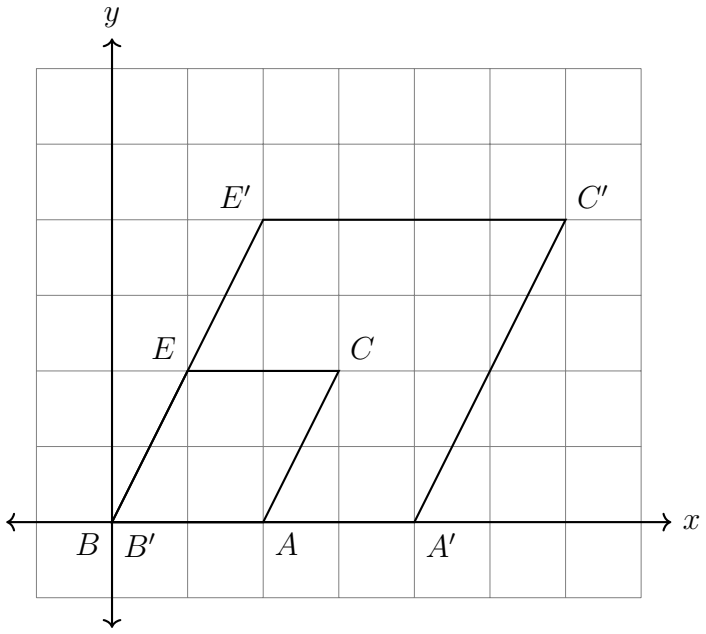
11. Given $\triangle ABC \sim \triangle DEF$, $m\angle A = 35°$, and $m\angle F = 105°$. Find $m\angle C$.

12. What is the transformation mapping parallelogram $BECA \to B'E'C'A'$, as shown in the diagram. (hint: Dilations must specify the center and scale factor.)



13. A dilation maps $\triangle ABC \to \triangle ADE$. Given $AB = 9$, $AC = 11.1$, $BC = 6$, $DE = 14$.

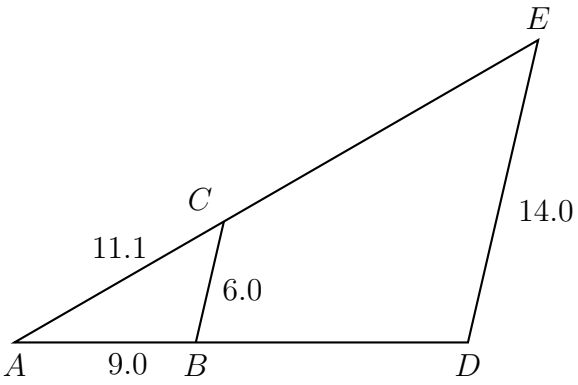
    Find the scale factor and side lengths:

    $k =$

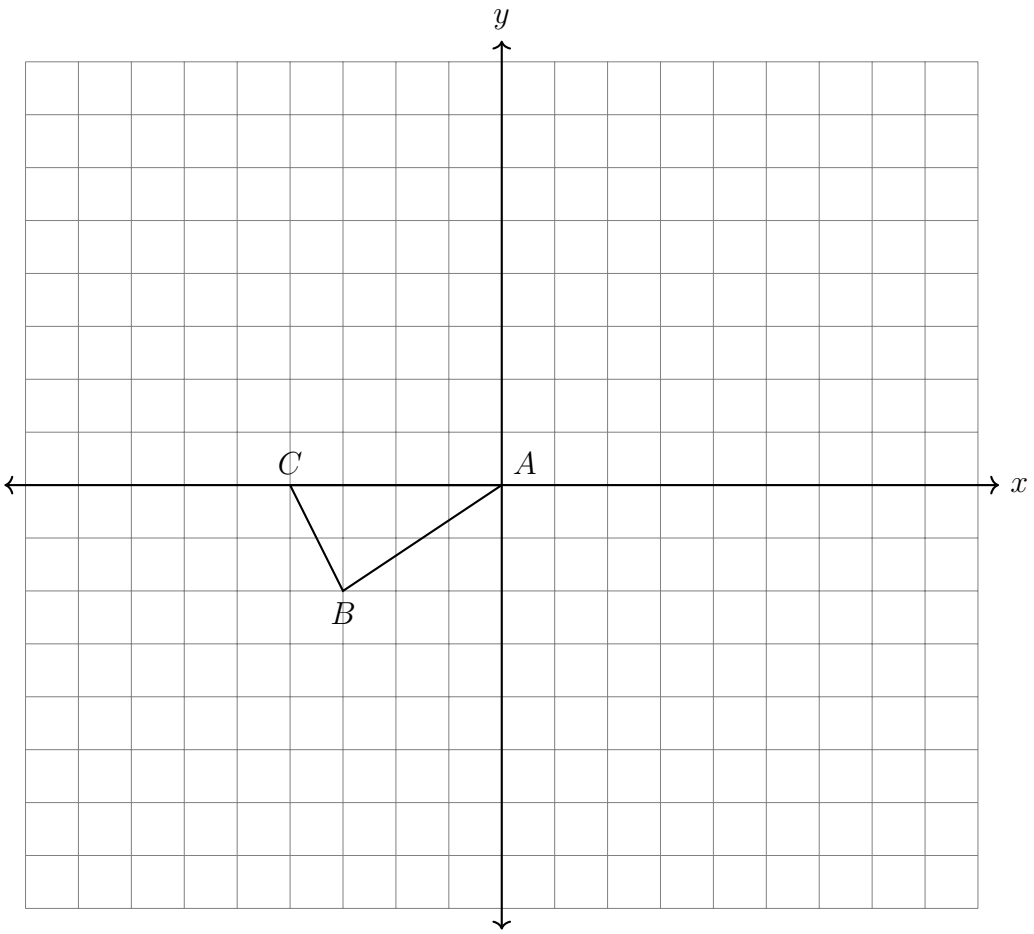
    $AD =$

    $AE =$

    $BD =$



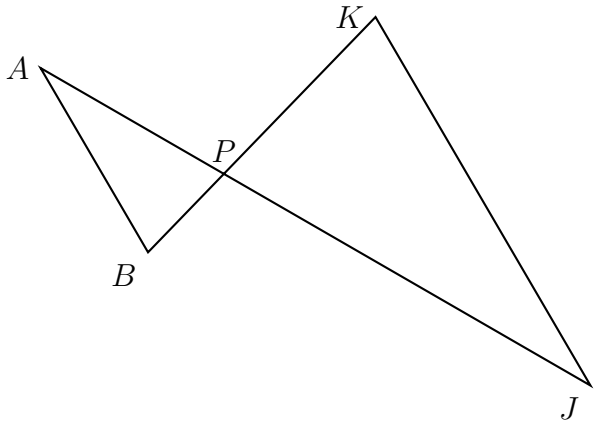
14. Reflect $\triangle ABC$ across the x-axis. Then, dilate $\triangle A'B'C'$ by a factor of k = 2 centered at the origin to produce $\triangle A''B''C''$. Plot and label the two triangles in the graph below.



15. Two triangles are shown with P the intersection of $\overline{AJ}$ and $\overline{BK}$.

    (a) Justify $\angle APB \cong \angle JPK$.

    (b) What angle must be congruent to $\angle B$ to prove $\triangle ABP \sim \triangle JKP$ by *angle-angle similarity*?



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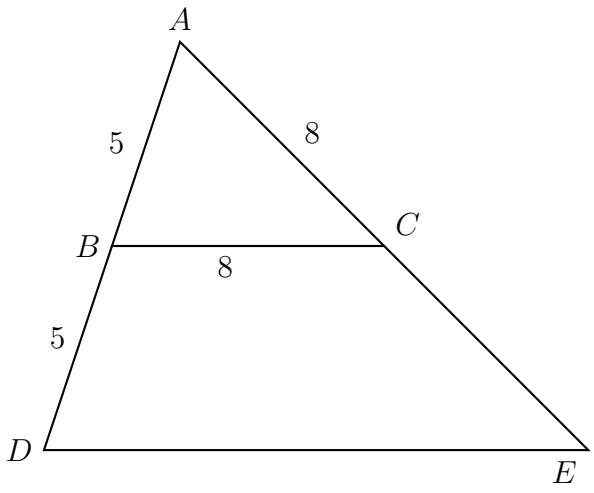
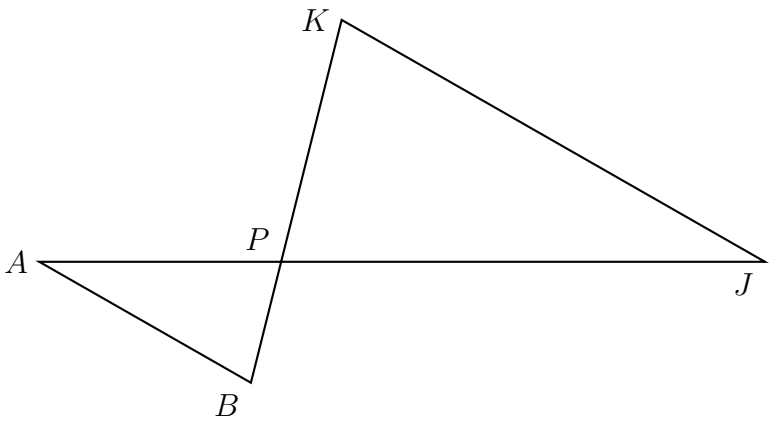
16. Triangle ADE is drawn with $\overline{BC} \parallel \overline{DE}$, as shown. Given $AB = 5$, $BC = 8$, $AC = 8$, and $BD = 5$. $m\angle A = 72°$.

    (a) Find DE.

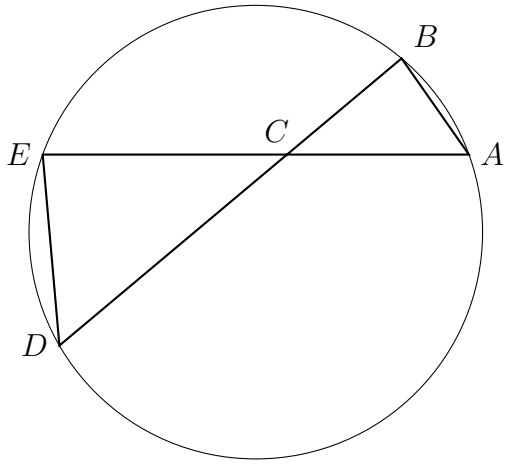
    (b) Find m$\angle ABC$ and m$\angle E$.



17. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 10$, $AP = 9.0$, $PK = 12.5$, and $JK = 25$. Find JP and BP.



18. In the diagram below, the chords $\overline{AE}$ and $\overline{BD}$ intersect at C, with $\triangle ABC \sim \triangle DEC$, $BC = 4$, $AC = 5$, and $BD = 11.5$. Determine the length of $\overline{CE}$.



19. In the diagram below $\triangle ABC \sim \triangle DEF$, $DE = x+4$, $AB = 12$, $AC = 21$, $DF = 2x+4$. Solve for x.