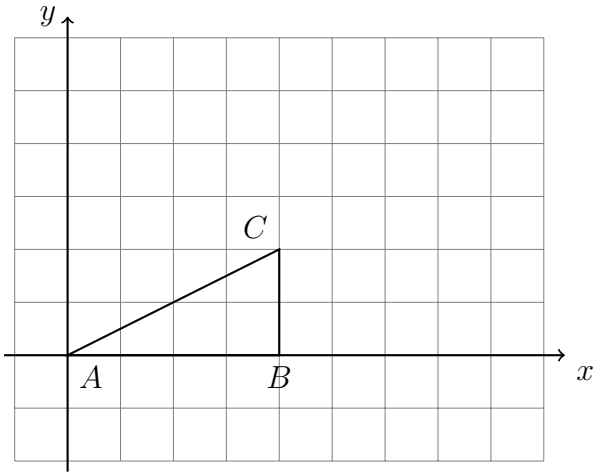
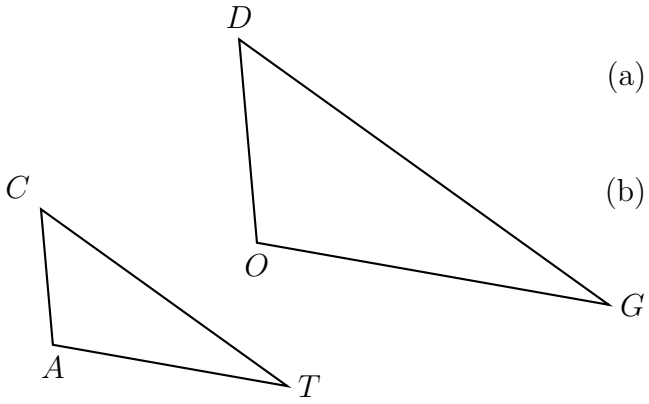
9.1 Classwork: Dilation **CCSS.HSG.SRT.B.5**

1. Do Now: Plot and label the triangle $A'B'C'$. $A'(0,0)$, $B'(8,0)$, $C'(8,4)$.
   Make a list of comparisons of the two triangles: their sides' lengths, location, their angles, orientation, area and perimeter.



2. Find the missing angle measures. Are $\triangle CAT$ and $\triangle DOG$ congruent?



(a) $m\angle C = 45°$, $m\angle A = 105°$

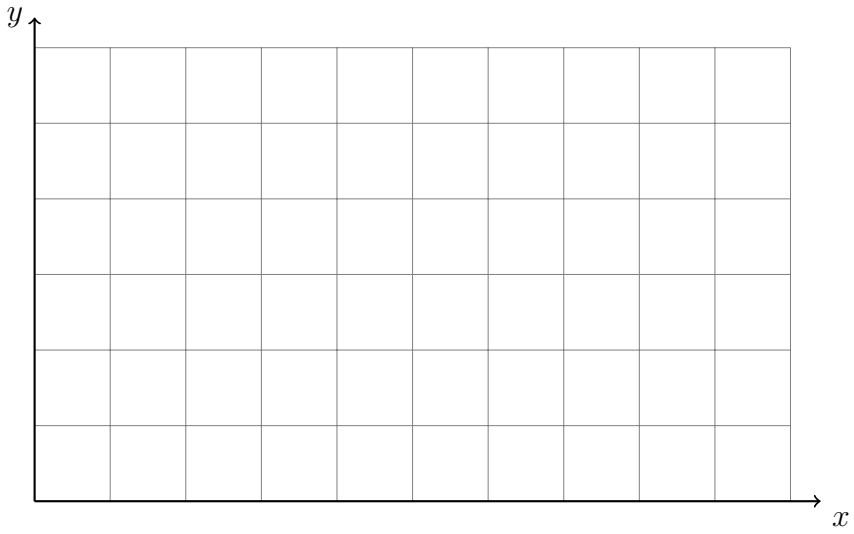
. $m\angle T =$ _____

(b) $m\angle G = 30°$, $m\angle O = 105°$

. $m\angle D =$ _____

3. This is the symbol for similar triangles: $\triangle ABC \sim \triangle DEF$. Write down two definitions of similar triangles.

4. (a) Graph and label $\triangle ABC$ with $A(0,0)$, $B(3,2)$, and $C(3,0)$.



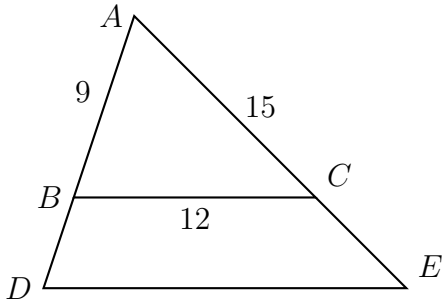
   (b) Dilate or stretch the triangle by a factor of $k = 3$ centered at the origin. $\triangle ABC \rightarrow \triangle A'B'C'$

   (c) Find each ratio or fraction.

$$\frac{A'C'}{AC} = \qquad \frac{B'C'}{BC} = \qquad \frac{A'B'}{AB} =$$

5. Triangle ABC is dilated with a scale factor of $k = \frac{5}{3}$ centered at A, yielding $\triangle ADE$, as shown. Given $AB = 9$, $BC = 12$, and $AC = 15$.

   Find AD, AE, and DE.



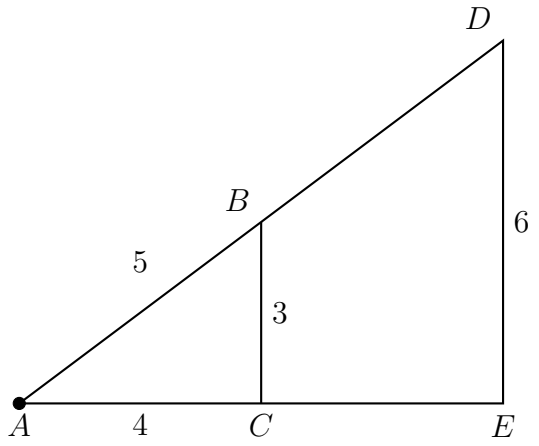
Definition of *similar* triangles: Triangles that have the same shape, but not necessarily the same size, are similar. Their corresponding angles are congruent and their corresponding sides are proportional.

Dilation definition of similarity: Two figures are similar if one or more rigid motions and a dilation will carry one figure onto the other.

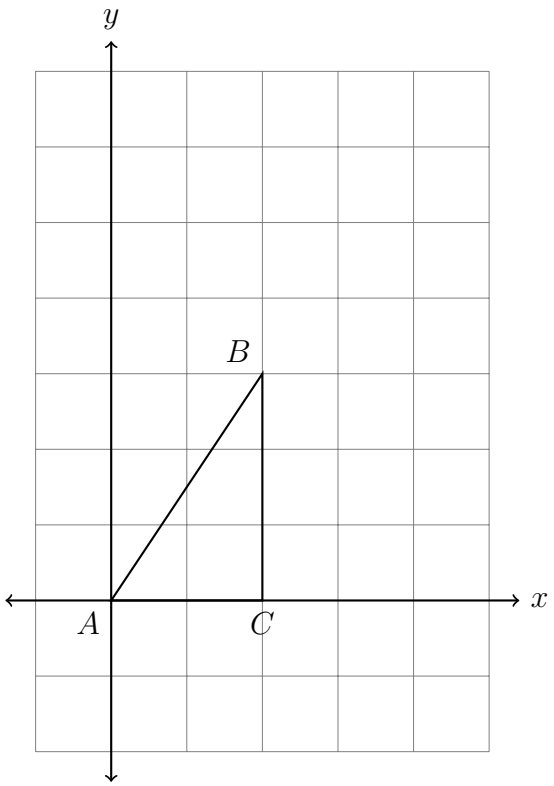
6. Vocabulary: A dilation stretches or shrinks. It has a *center* and a *scale factor, k*.

   A dilation centered at A with scale factor $k = 2$ maps $\triangle ABC \to \triangle ADE$. Given the sides of the preimage, $AC = 4$, $BC = 3$, $AB = 5$.

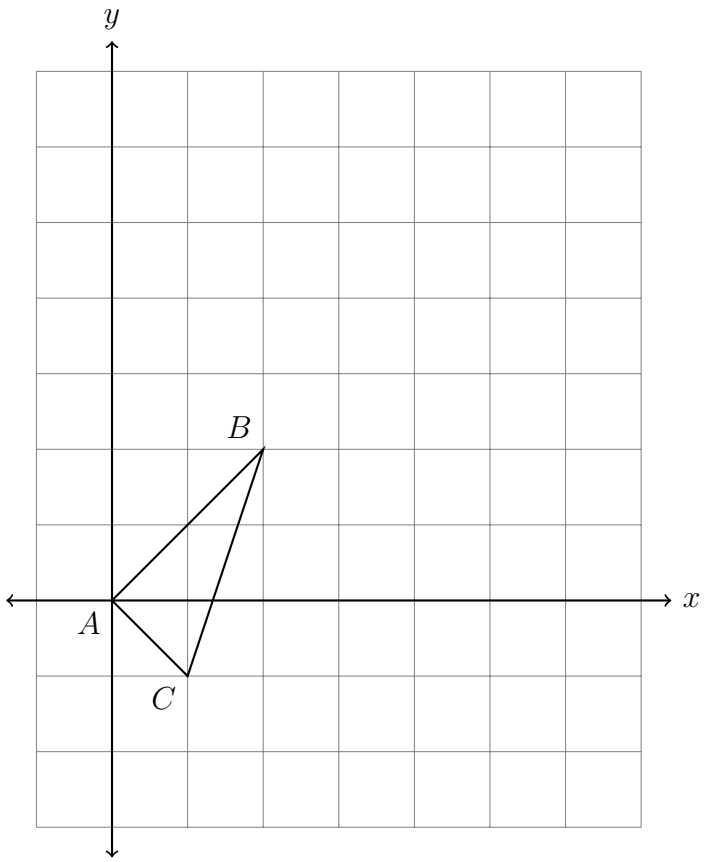
   $DE = 6$, how long are AD and AE?



7. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 2$ centered at the origin, $(x, y) \to (2x, 2y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.

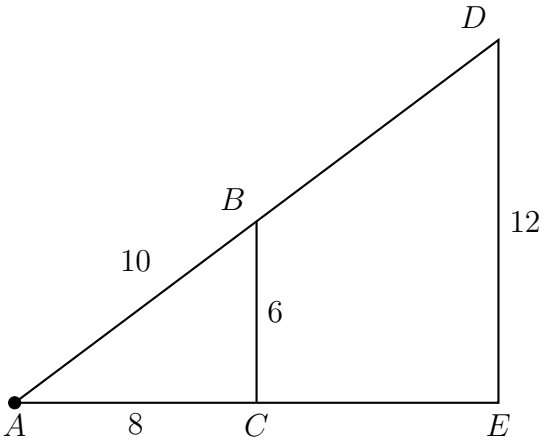


8. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 3$ centered at the origin, $(x, y) \to (3x, 3y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.

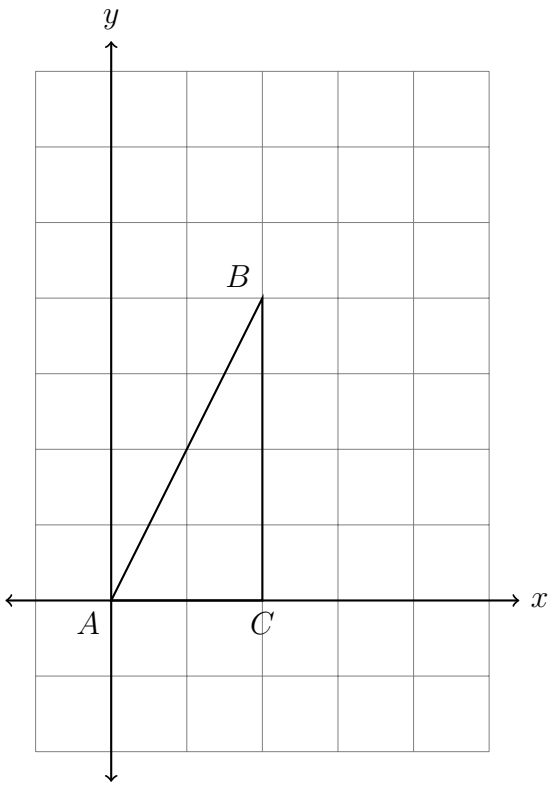


9. A dilation centered at A with scale factor $k = 2$ maps $\triangle ABC \to \triangle ADE$. Given the sides of the preimage, $AC = 8$, $BC = 6$, $AB = 10$.

   $DE = 12$, how long are AD and AE?

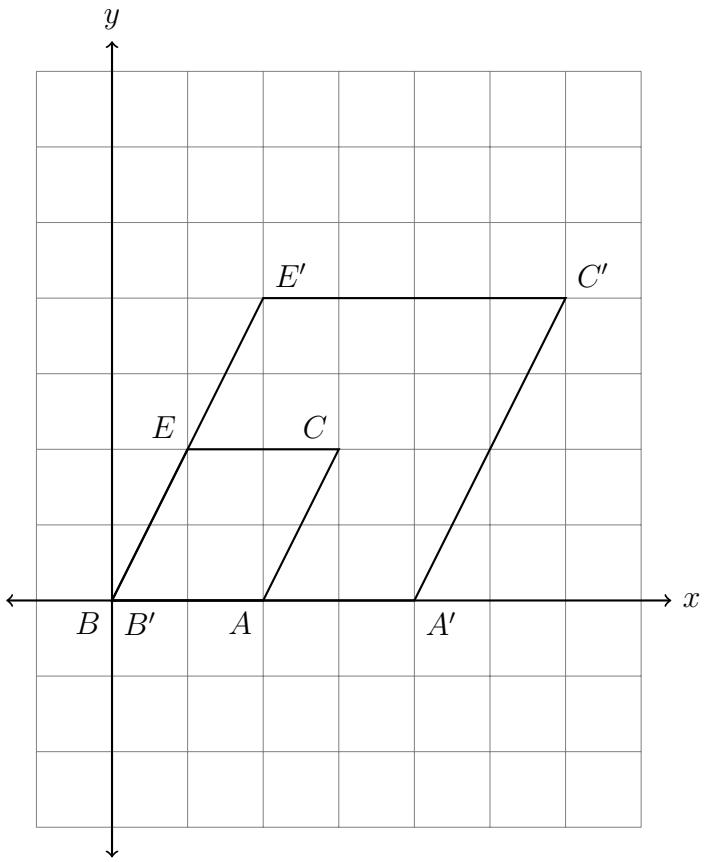


10. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 1.5$ centered at the origin, $(x, y) \to (1.5x, 1.5y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.

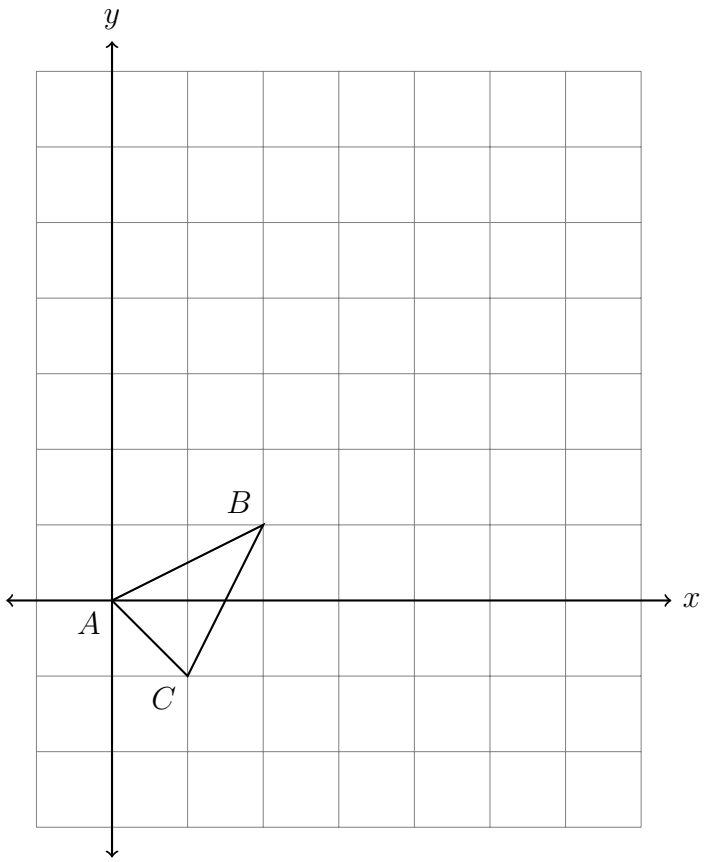


11. A transformation is performed on a parallelogram, $BECA \rightarrow B'E'C'A'$, as shown in the diagram.

    Fully characterize the transformation. (hint: Translations must include both x and y directions and magnitudes. Dilations must specify the center and scale factor.)

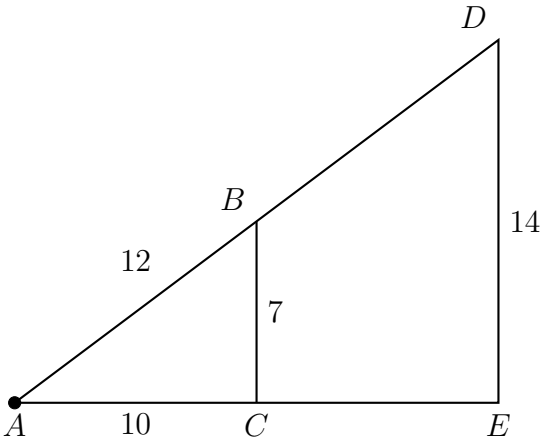


12. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 3$ centered at the origin, $(x, y) \to (3x, 3y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.

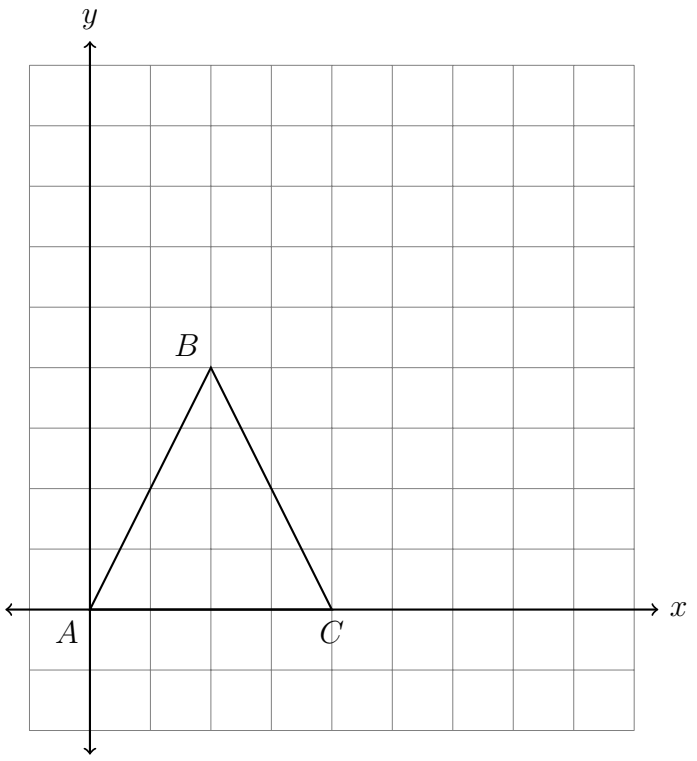


13. A dilation centered at A with scale factor $k = 2$ maps $\triangle ABC \to \triangle ADE$. Given the sides of the preimage, $AC = 10$, $BC = 7$, $AB = 12$.

    $DE = 14$, how long are AD and AE?

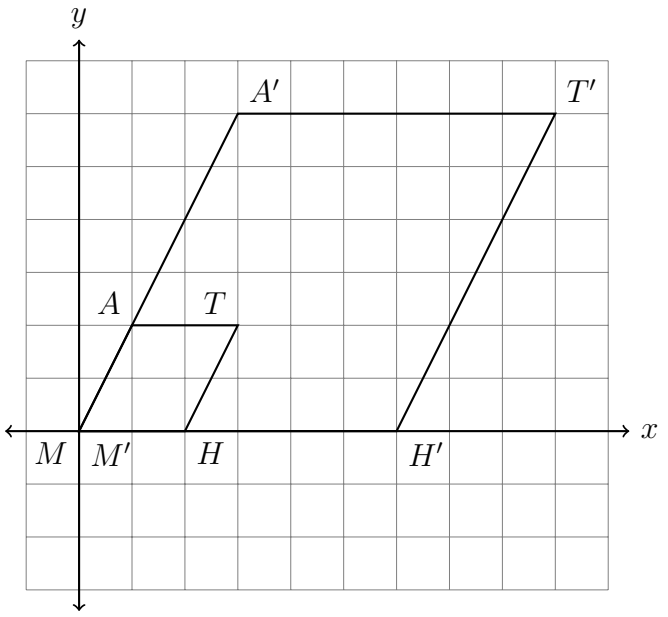


14. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 1.5$ centered at the origin, $(x, y) \to (1.5x, 1.5y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.



15. A transformation is performed on a parallelogram, $MATH \to M'A'T'H'$, as shown in the diagram.

    What is the transformation? (Hint: Is it a translation, reflection, rotation, or dilation? What is its center? What is the scale factor, k?)



16. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = 2.5$ centered at the origin, $(x, y) \to (2.5x, 2.5y)$. Plot and label the image on the axes. (table optional)

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