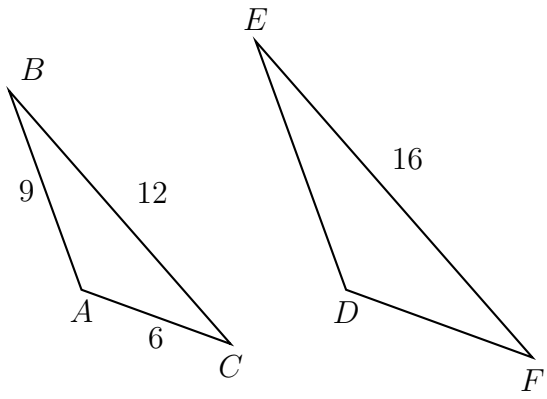
Unit 9: Dilation Name:
17 March 2023

9.4 Classwork: Compositions **CCSS.HSG.SRT.B.5**

1. A dilation maps $\triangle ABC \to \triangle DEF$, with $AB = 9$, $BC = 12$, $AC = 6$, and $EF = 16$.



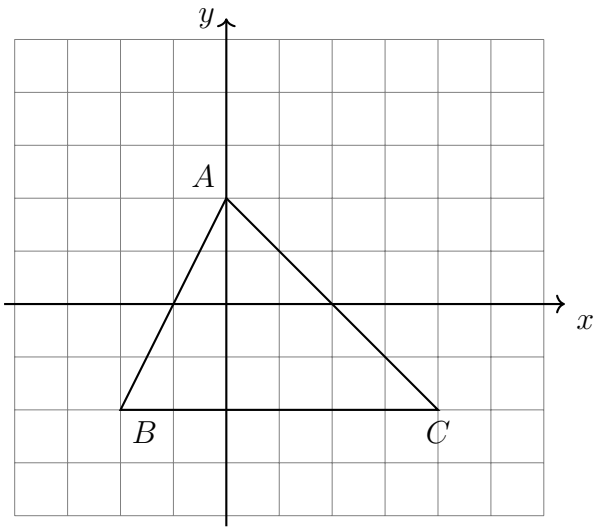
Find the scale factor and missing sides.

(a) $k =$

(b) $DE =$

(c) $DF =$

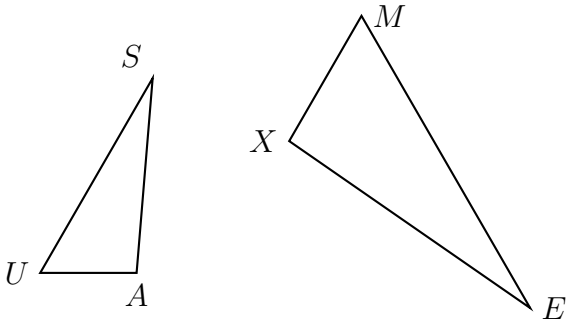
2. Dilate the triangle $ABC \to A'B'C'$ by a factor of $k = 1.5$ centered at the origin.



Graph and label the image and complete the table of coordinate mappings.

$A(0, 2) \to A'(0, 3)$

3. Given $\triangle USA \sim \triangle MEX$ and $m\angle M = 60°$, $m\angle E = 25°$. Find the remaining angle measures of both triangles.



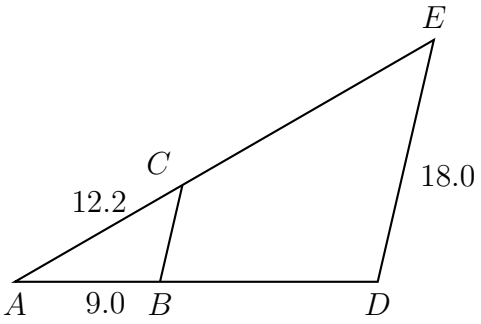
4. A dilation centered at A with a scale factor of $k = 2.5$ maps $\triangle ABC \to \triangle ADE$. Given $AB = 9.0$, $AC = 12.2$, $DE = 18.0$.

   Find the following side lengths:

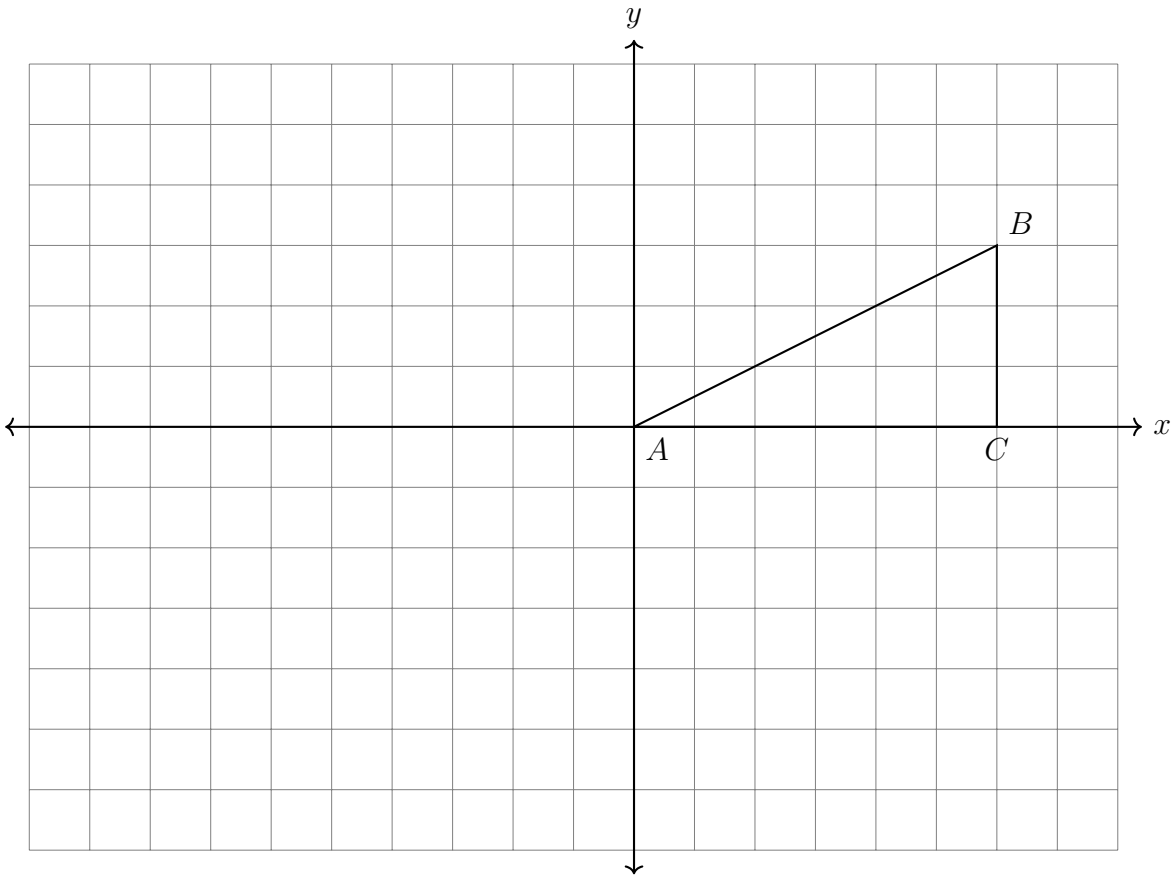
   $AD =$

   $AE =$

   $BC =$

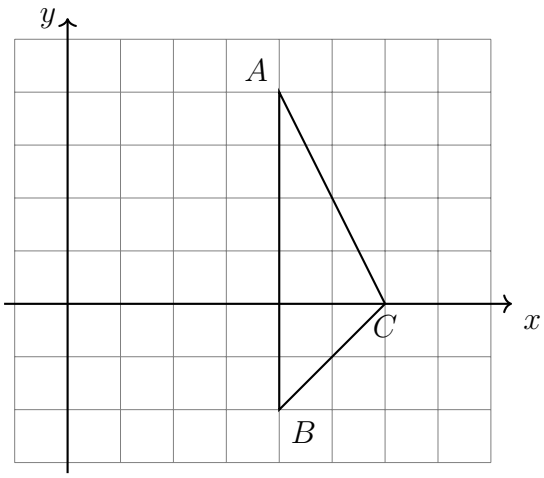


5. Rotate $\triangle ABC$ 180° counterclockwise around the origin. Then, dilate $\triangle A'B'C'$ by a factor of $k = \frac{5}{3}$ centered at the origin to produce $\triangle A''B''C''$. Plot and label the two triangles in the graph below.



   Would the same triangle result if you dilated first and then rotated? When are rotation and dilation "commutative", never, sometimes, always?

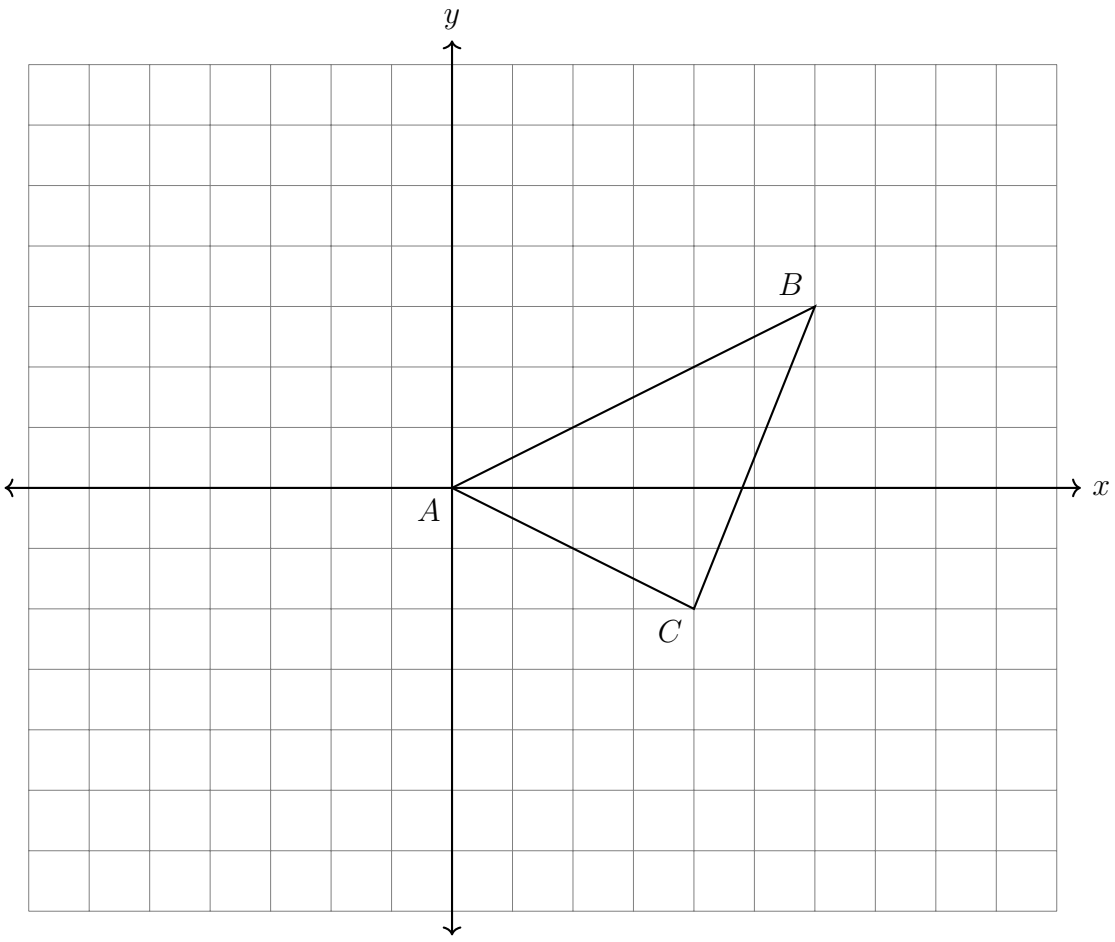
6. Dilate $\triangle ABC \to \triangle A'B'C'$ by a factor of $k = \frac{1}{2}$ centered at $(0, 0)$. (it shrinks)



Graph and label the image and complete the table of coordinate mappings.

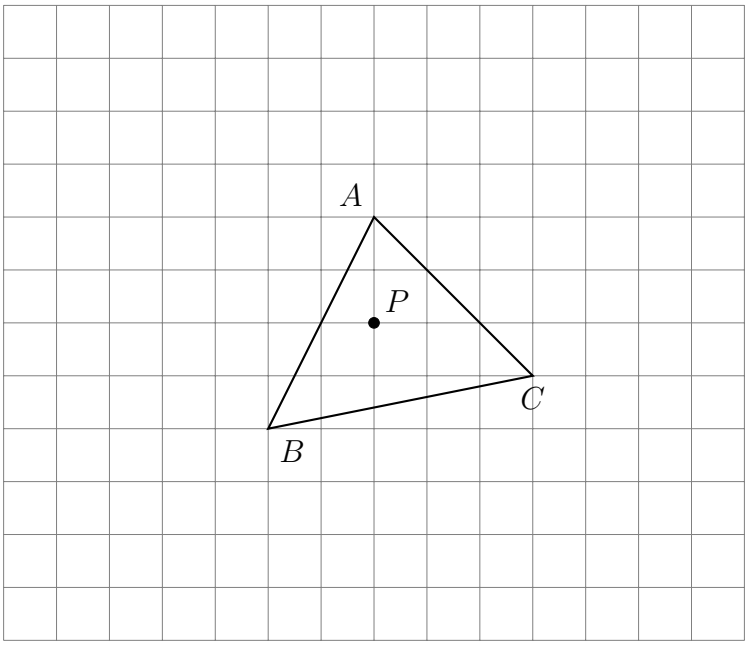
$A(4, 4) \to$

7. On the graph below reflect $\triangle ABC \to \triangle A'B'C'$ over the x-axis. Then, dilate $\triangle A'B'C'$ by a factor of $k = \dfrac{3}{2}$ centered at the origin to produce $\triangle A''B''C''$. Plot and label the two triangles completely.



8. A dilation with a scale factor $k = 3$ centered at $(0, 0)$ maps $A(4, -2) \to A'(p, q)$. Find the values of p and q.

9. A dilation centered at point P with a scale factor of $k = 2$ is applied to $\triangle ABC$. Plot and label the image $\triangle A'B'C'$ on the graph.



10. A triangle has a base length $b = 10$ and height $h = 8$.

    (a) Find the area of the triangle.

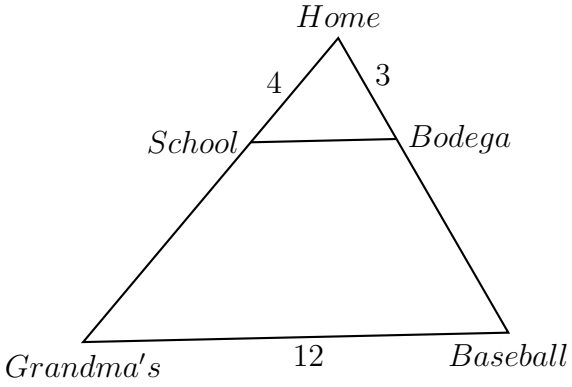
    (b) The triangle is dilated by a factor $k = 2$. Find the area of the image.

    (c) The original triangle is dilated by a factor of three. What is the ratio of the area of this image to the original triangle's area?

11. Steven and Marie live close to school and Tio's bodega, but also like to go to Grandma's house and the baseball field, which are further away. A sketch of the locations is shown below, essentially two triangles with a scale factor $k = 3$ centered at home.

    From home it's 4 blocks to school and 3 to the bodega. From Grandma's to the baseball field is 12 blocks. There are twenty blocks to a mile.

    (a) Steven stops at the bodega on his way to school. How far does he walk, in terms of both blocks and miles?



    (b) Marie goes to play baseball from school. Which way is shorter, passing by the bodega or the route by Grandma's? By how many blocks is it shorter? Justify your answer.