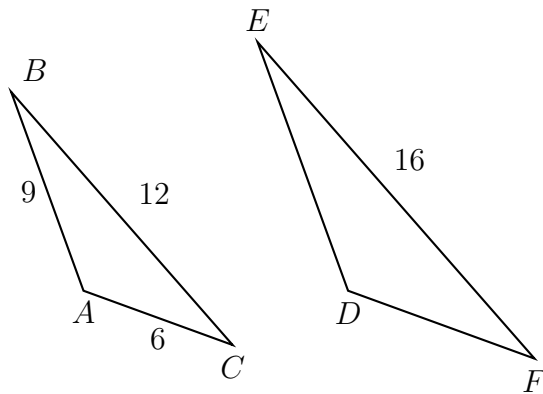


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### 9.3 Classwork: Compositions

CCSS.HSG.SRT.B.5

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



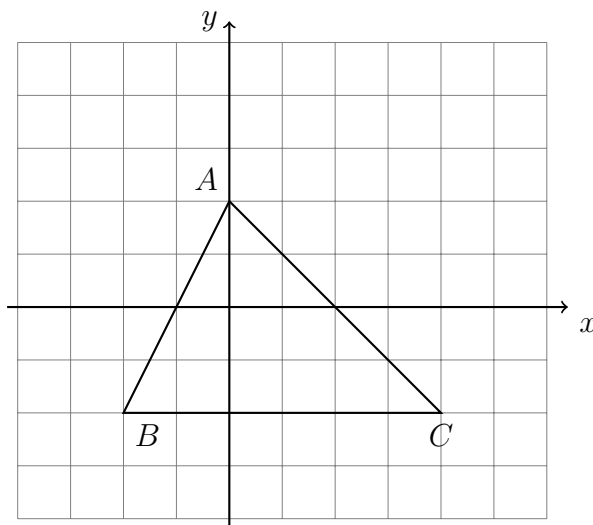
Find the scale factor and missing sides.

(a)  $k =$

(b)  $DE =$

(c)  $DF =$

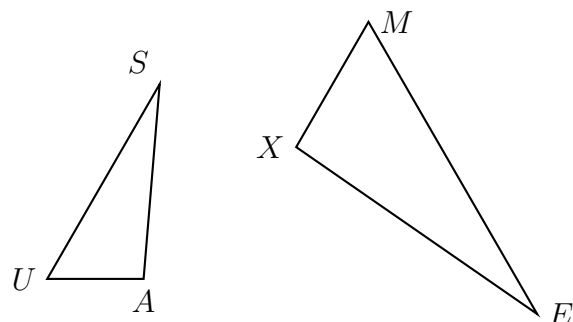
2. Dilate the triangle  $ABC \rightarrow A'B'C'$  by a factor of  $k = 1.5$  centered at the origin.



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

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

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



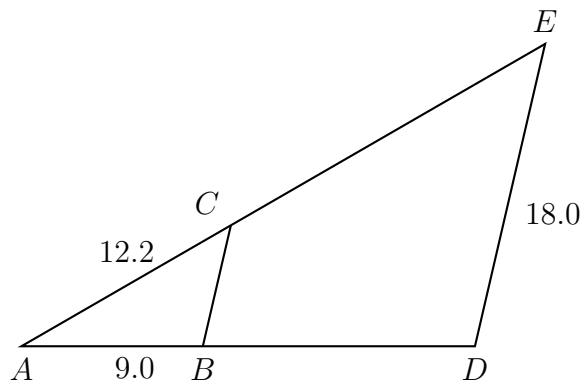
4. A dilation centered at  $A$  with a scale factor of  $k = 2.5$  maps  $\triangle ABC \rightarrow \triangle ADE$ . Given  $AB = 9.0$ ,  $AC = 12.2$ ,  $DE = 18.0$ .

Find the following side lengths:

$$AD =$$

$$AE =$$

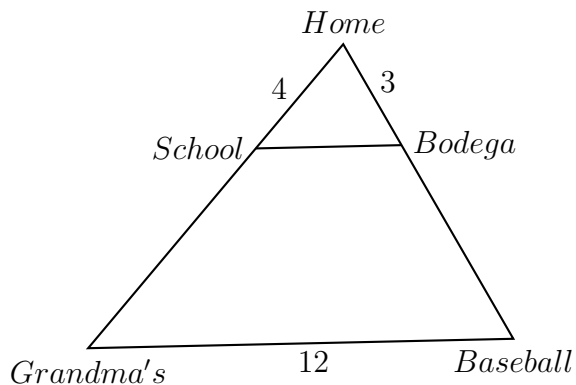
$$BC =$$



5. 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.

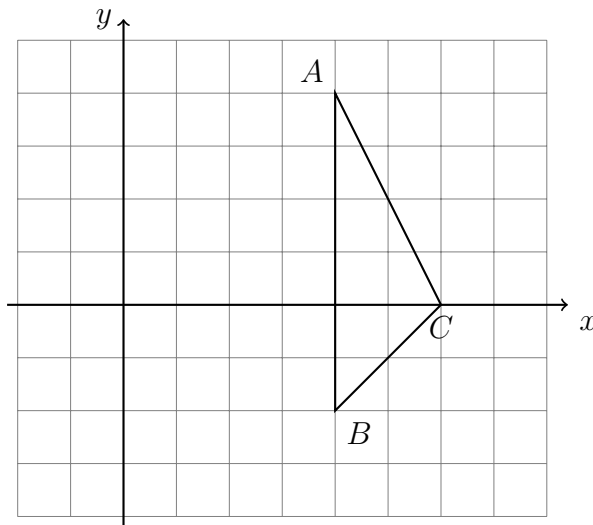
- (a) Steven stops at the bodega on his way to school. How far does he walk, in terms of both blocks and miles?



- (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.

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

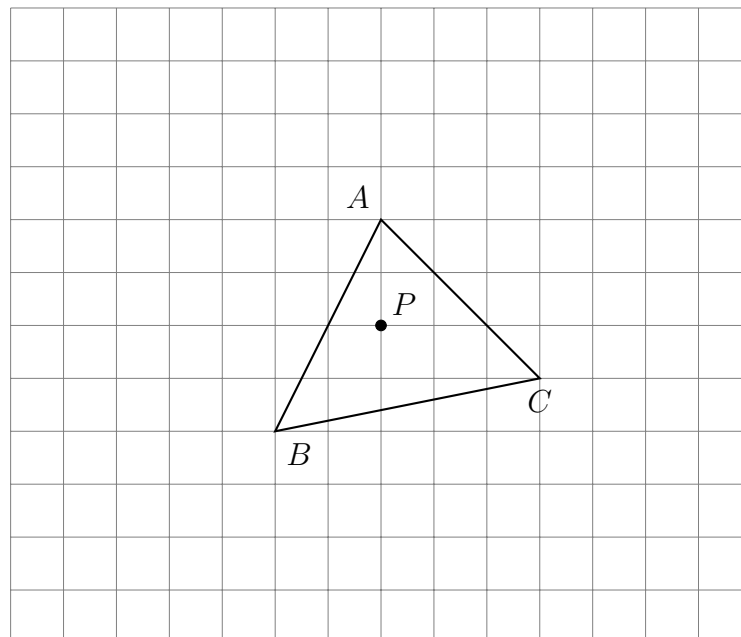


Graph and label the image and complete the table of coordinate mappings.

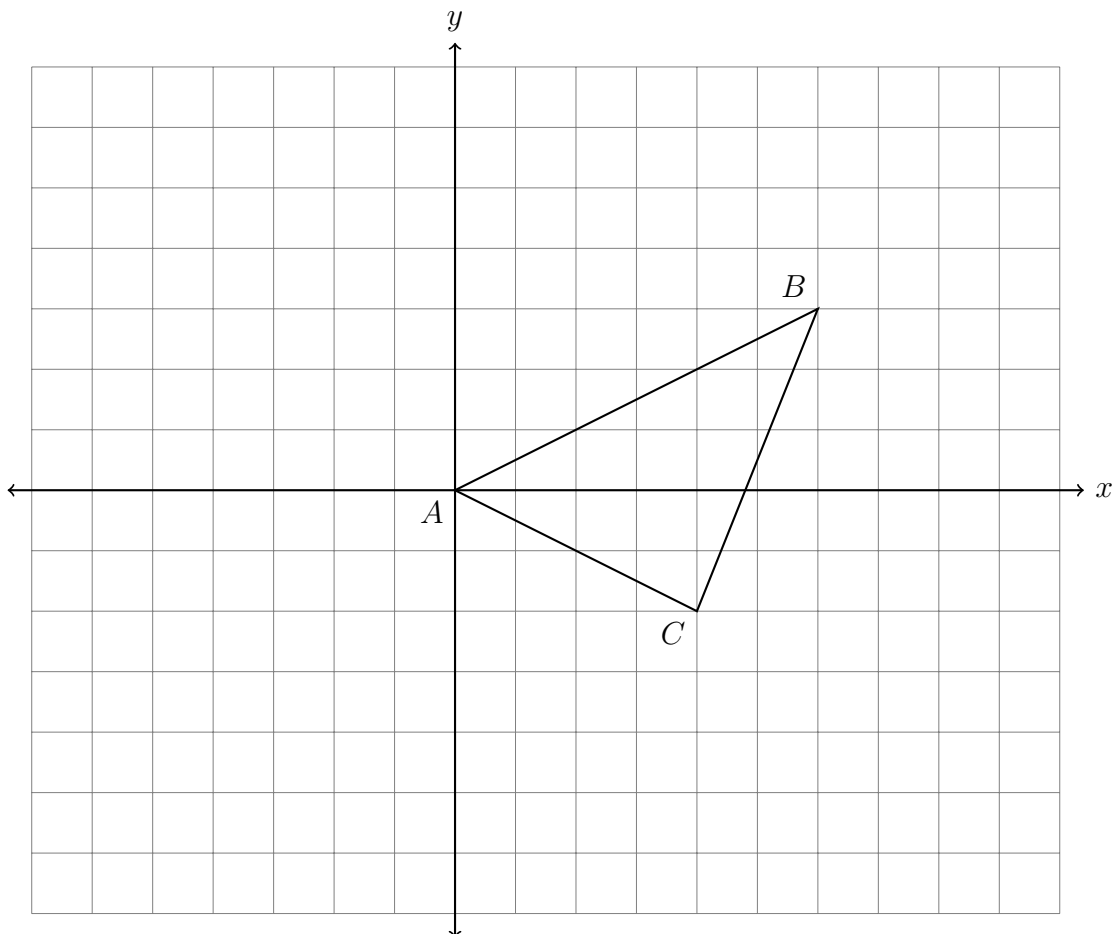
$A(4, 4) \rightarrow$

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

8. 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.



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



- Would the same triangle result if you dilated first and then reflected? When are reflection and dilation “commutative”, never, sometimes, always?
10. A triangle has a base length  $b = 10$  and height  $h = 8$ .
- Find the area of the triangle.
  - The triangle is dilated by a factor  $k = 2$ . Find the area of the image.
  - 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?