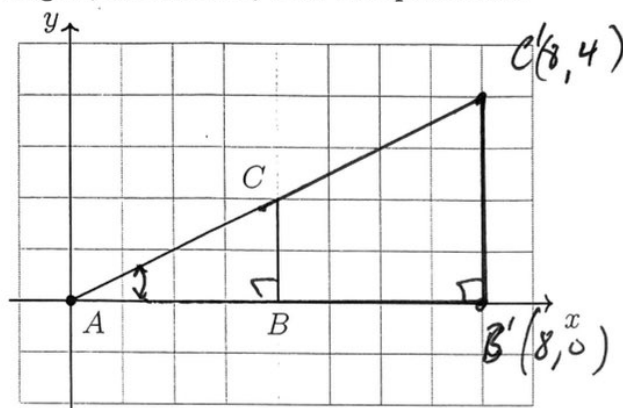


9.1 Classwork: Dilation

CCSS.HSG.SRT.B.5

1. 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.



$$AB = 4 \quad A'B' = 8$$

$$BC = 2 \quad B'C' = 4$$

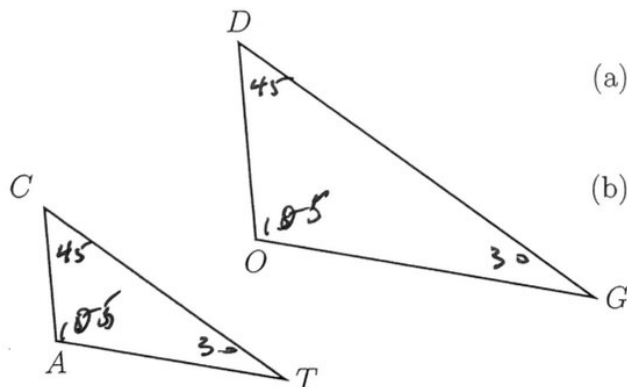
double length ($k=2$)

angles the same

$$m\angle B = 90$$

$$m\angle B' = 90$$

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



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

$$m\angle T = 30$$

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

$$m\angle D = 45$$

$$30 + 45 + 105 = 180$$

3. A rectangle has a length and width of 4 and 3, giving it an area of
- $A = 4 \times 3 = 12$
- and perimeter of
- $P = 4 + 4 + 3 + 3 = 14$
- . It is dilated by a scale factor of
- $k = 2$
- .

- (a) Find the length and width of the dilated figure.

$$l = 8 \quad w = 6$$

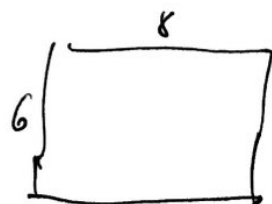


- (b) Find the area of the dilated figure.

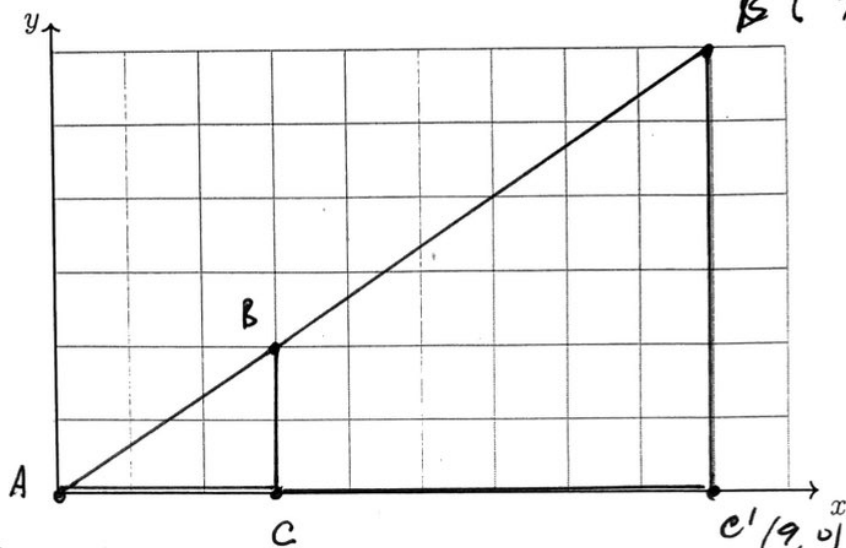
$$8 \times 6 = 48 \text{ four times}$$

- (c) Find the perimeter of the dilated figure.

$$8 + 8 + 6 + 6 = 28 \text{ doubled}$$



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.

$$\frac{A'C'}{AC} = \frac{9}{3} = 3$$

$$\frac{B'C'}{BC} = \frac{6}{2} = 3$$

$$\frac{A'B'}{AB} = 3$$

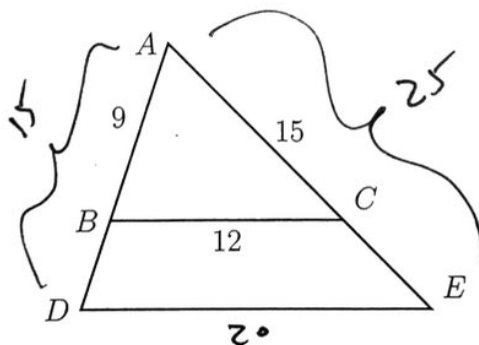
5. Triangle ABC is dilated with a scale factor of $k = \frac{5}{3}$ centered at A, yielding $\triangle ADE$, as shown. Given $AB = 9$, $BC = 12$, and $AC = 15$.

Find AD, AE, and DE.

$$AD = \frac{5}{3}(9) = 15$$

$$AE = \frac{5}{3}(15) = 25$$

$$DE = \frac{5}{3}(12) = 20$$



Name:

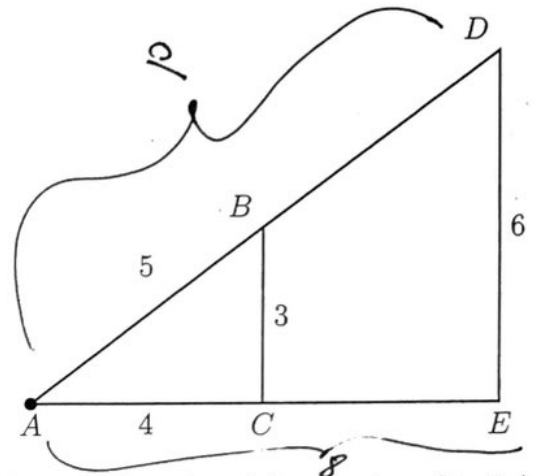
6. A dilation centered at A with scale factor $k = 2$ maps $\triangle ABC \rightarrow \triangle ADE$. Given the sides of the preimage, $AC = 4$, $BC = 3$, $AB = 5$.

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

$$\begin{aligned}\overline{BC} &\rightarrow \overline{DE} \\ 3 &\rightarrow 6 \\ k &= \frac{6}{3} = 2\end{aligned}$$

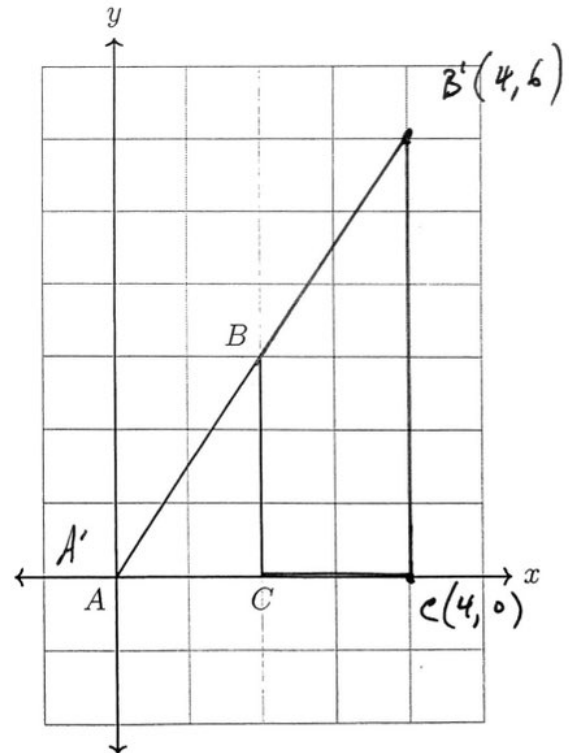
$$AD = 2(5) = 10$$

$$AE = 2(4) = 8$$



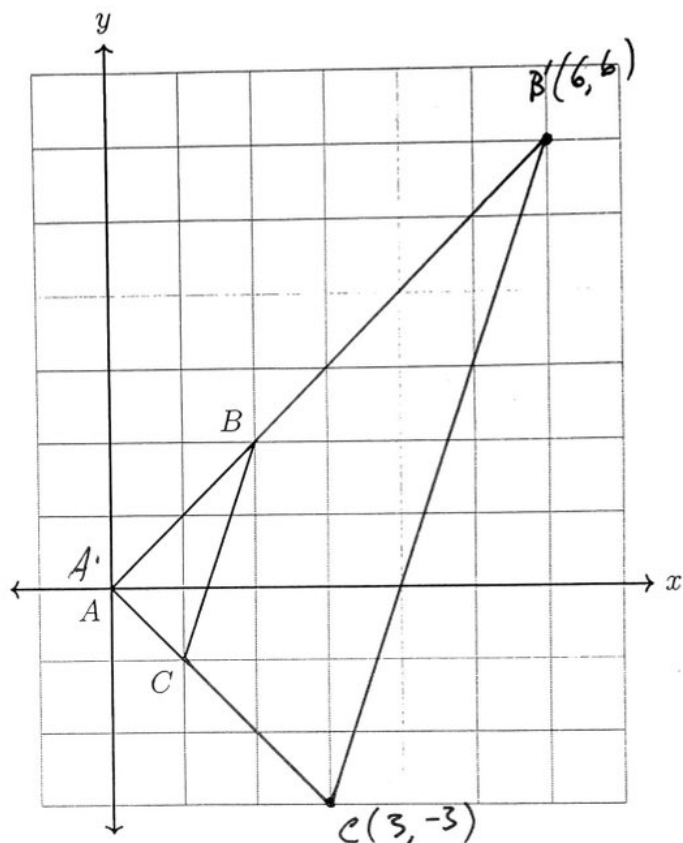
7. Dilate $\triangle ABC \rightarrow \triangle A'B'C'$ by a factor of $k = 2$ centered at the origin, $(x, y) \rightarrow (2x, 2y)$. Plot and label the image on the axes. Make a table of the vertices and their coordinates.

$$\begin{aligned}A(0, 0) &\rightarrow A'(0, 0) \\ B(2, 3) &\rightarrow B'(4, 6) \\ C(2, 0) &\rightarrow C'(4, 0)\end{aligned}$$



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

$$\begin{aligned} A(0, 0) &\rightarrow A'(0, 0) \\ B(2, 2) &\rightarrow B'(6, 6) \\ C(1, -1) &\rightarrow C'(3, -3) \end{aligned}$$



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

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

$$\overline{BC} \rightarrow \overline{DE}$$

$$6 \rightarrow 12$$

$$k = \frac{12}{6} = 2$$

$$AD = 2(10) = 20$$

$$AE = 2(8) = 16$$

