Dilations Day 2 Notes **Name:**_____ **Per.**_____

Honors Geometry 7.6
Geometry

Dilating Figures on a Coordinate Graph

Dilations. To dilate a figure means to ___enlarge___ or ___reduce___ the figure. The scale factor determines how much larger or smaller the figure will become. A scale factor ___greater___ than ___1___ will enlarge the figure. A scale factor ___less___ than ___1___ (and greater than zero) will reduce the figure.

$0 < k < 1$

Center of Dilation. Where the dilated figure is drawn depends not only on the ___scale factor___, but also on where the ___center___ of ___dilation___ is located. When the corresponding points of the original figure and the dilated figure are connected by straight lines, the ___single point___ where all the lines meet is the ___center___ of ___dilation___. The center of dilation may be the ___origin___ or it may be any ___other point___, such as a vertex of the original figure.

Center of Dilation at the Origin. When the center of dilation is the origin, You can just ___multiply___ the coordinates of the ___vertices___ of the original figure by the ___scale factor___ to find the coordinates of the vertices of the dilated figure. That is, the coordinate rule for a dilation with the center of dilation at the origin is: $(x, y) \rightarrow (kx, ky)$ where k is the ___scale factor___.

Dilate each figure using the given point as the center of dilation. Unfortunately, there is no easy coordinate rule for making dilations when the center of dilation is a point other than the origin. Instead, you have to ___multiply___ the distance from the center of dilation to each ___vertex___ by the ___scale factor___.

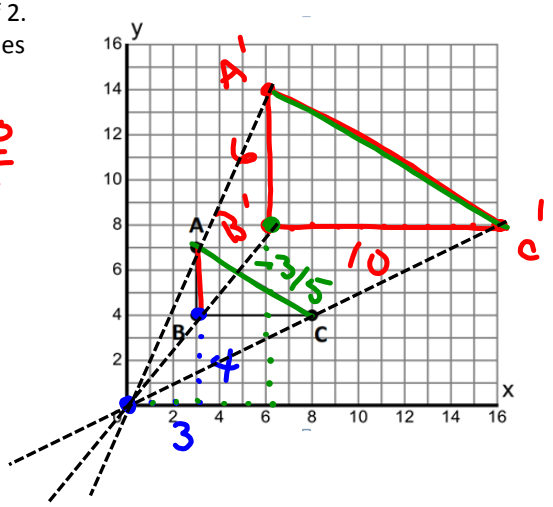
Example 1: Dilate Δ*ABC* with a scale factor of 2 from the origin. Graph the image of Δ*ABC* with a scale factor of 2. Graph the image and verify that the corresponding sides of the pre-image and image are parallel and proportional after the dilation

$\frac{6}{3} = \frac{10}{5}$

$A(3,7) \Rightarrow A'(6,14)$

$B(3,4) \Rightarrow B'(6,8)$

$C(8,4) \Rightarrow C'(16,8)$

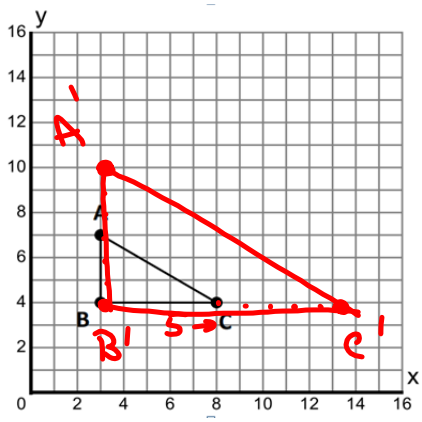


Example 2: Dilate Δ*ABC* with a scale factor of 2 from point *B*. Graph the image of Δ*ABC* and explain what is different (and why) about the corresponding sides of this dilation from the dilation performed in Example 1.

$A(3,7) \Rightarrow A'(3,10)$

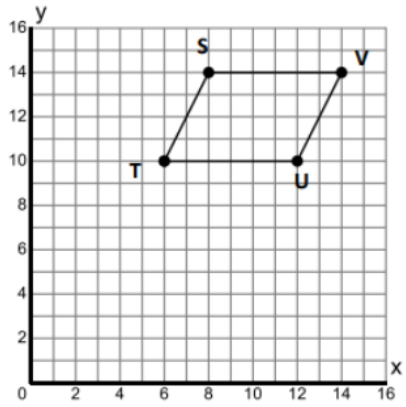
$B(3,4) \Rightarrow B'(3,4)$

$C(8,4) \Rightarrow C'(13,4)$



Perform the following dilations as described.

1. Parallelogram STUV with a scale factor of $\frac{1}{2}$ from the origin.



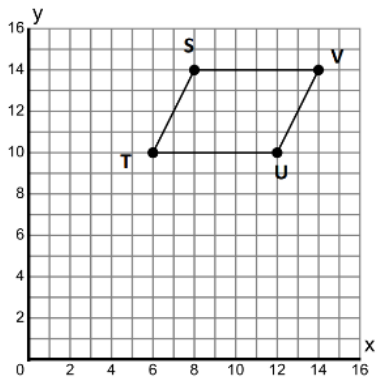
S( ) → S′ ( )

T( ) → T′ ( )

U( ) → U′( )

V( ) → V′ ( )

2. Parallelogram STUV with a scale factor of $\frac{1}{2}$ from point S.



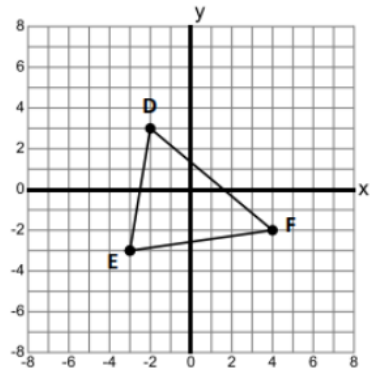
S( ) → S′ ( )

T( ) → T′ ( )

U( ) → U′( )

V( ) → V′ ( )

3. ΔDEF with center at origin and scale factor of $\frac{3}{2}$.

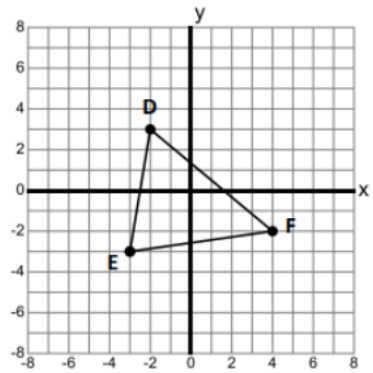


D( ) → D′ ( )

E( ) → E′ ( )

F( ) → F′ ( )

4. ΔDEF with center at point D and scale factor of 0.5.

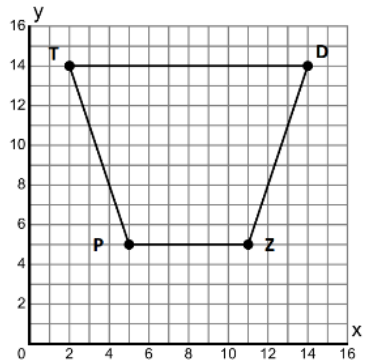


D( ) → D' ( )

E( ) → E' ( )

F( ) → F' ( )

5. Trapezoid TPZD with center at P and scale factor of $\frac{1}{3}$.



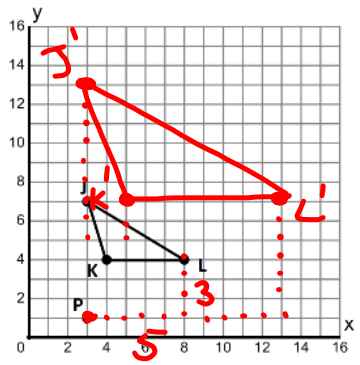
T( ) → T' ( )

D( ) → D' ( )

Z( ) → Z' ( )

P( ) → P' ( )

6. ΔJKL with center at P and a scale factor of 2.

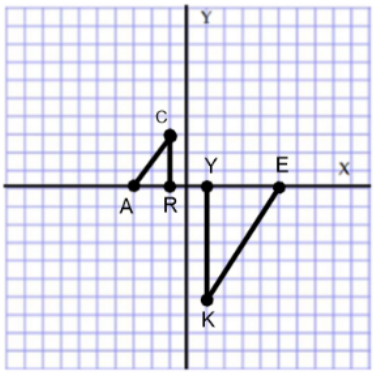


J(3,7) → J' (3,13)

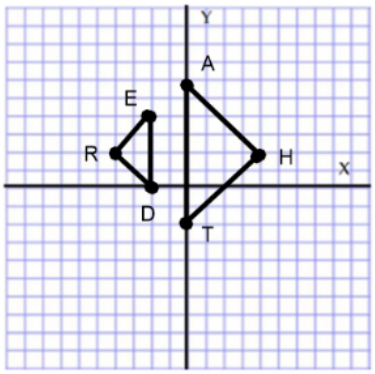
K(4,4) → K' (5,7)

L(8,4) → L' (13,7)

7. Determine the sequence of similarity transformations that maps ΔARC onto ΔEYK, so that the figures are similar.



8. Determine the sequence of similarity transformations that maps ΔAHT onto ΔERD, so that the figures are similiar.



9. Determine the sequence of similarity transformations that maps ΔFAT onto ΔKDI, so that the figures are similar.