Name: Kelly Date: ____________

UNIT 5 LESSON 8

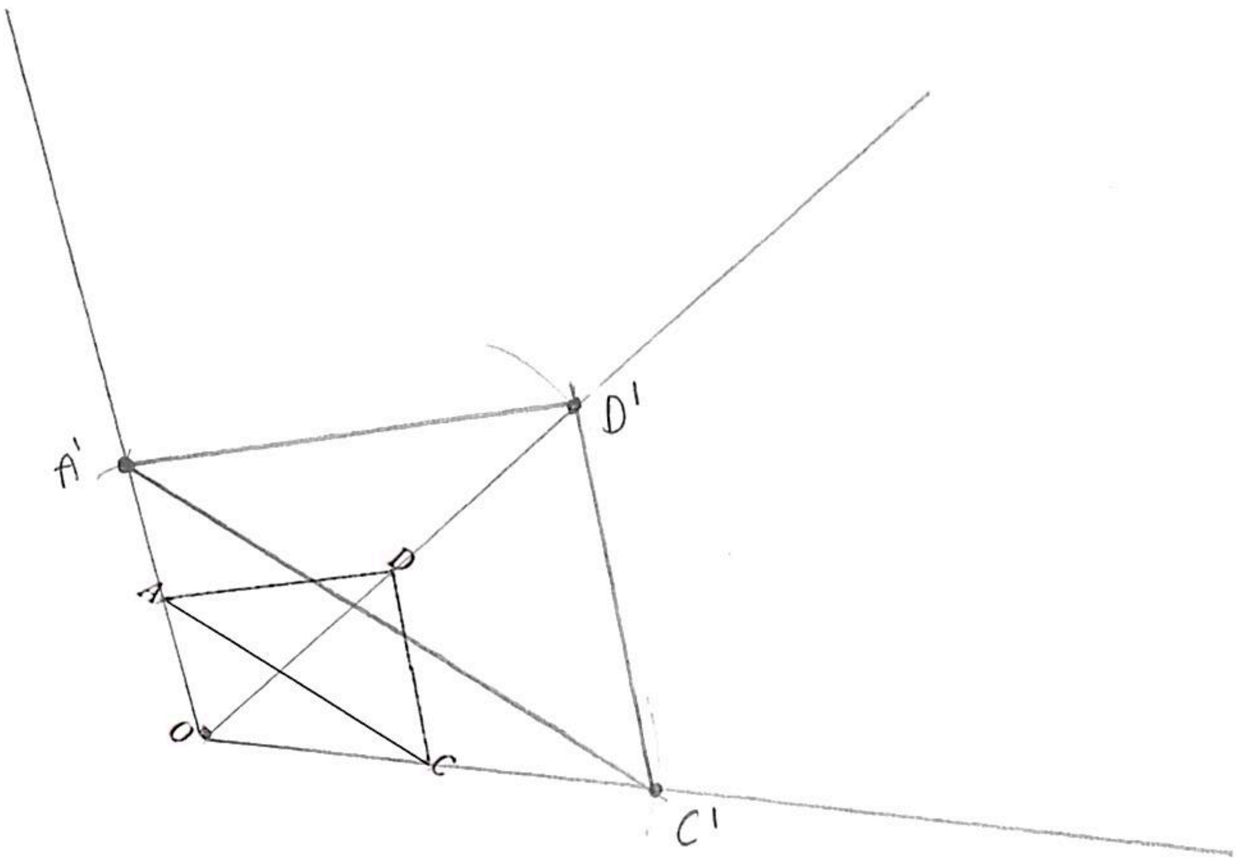
AIM: HOW DO WE CONSTRUCT DILATIONS?

SCENARIO #1: DILATING FIGURES FROM A POINT NOT ON THE FIGURE WHEN $k > 1$

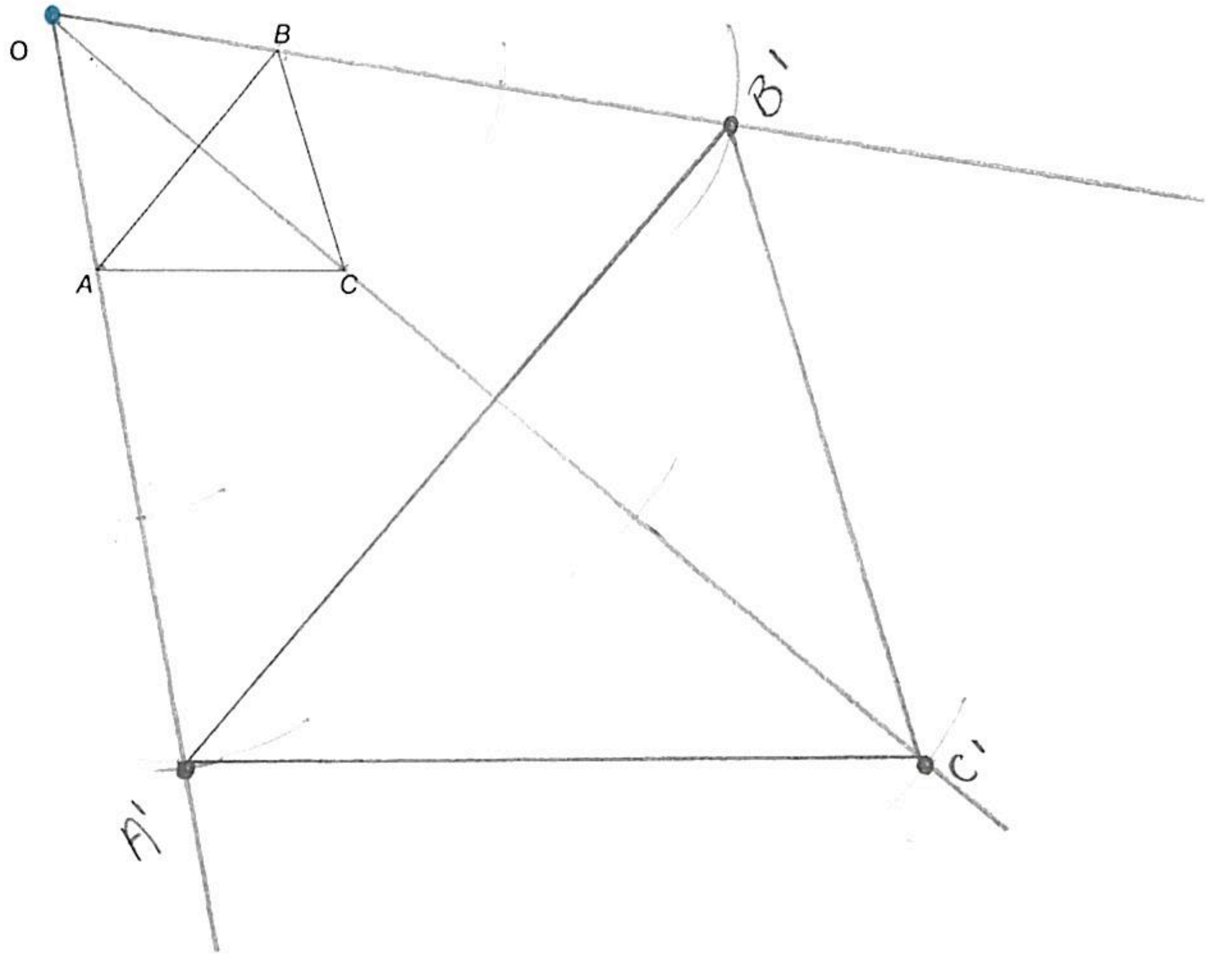
STEPS:

1. Connect center of dilation to each vertex of the triangle. Extend the lines beyond the triangle.
2. Using you compass, measure the distance from the center of dilation to one of the vertices. This represents a scale factor of 1.
3. Move the needle of your compass to the vertex on the triangle and make an arc on the extended line. This represents a scale factor of 2.
4. Each repetition of step 3 will represent a greater scale factor. Continue this until you meet your desired scale factor.
5. Repeat this process for each vertex of the triangle.
6. Connect new points.

EXAMPLE #1: Create a scale drawing of the figure below about center O and scale factor $r = 2$.



EXAMPLE #2: Construct the image of ΔABC after a dilation with center of dilation O and scale factor 3.



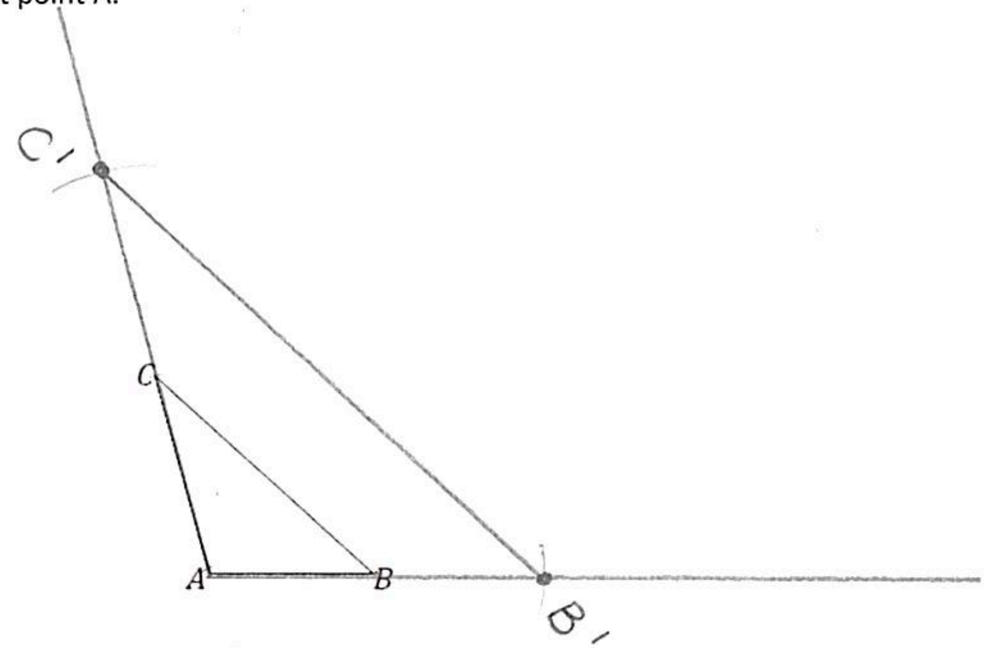
Length of the Sides	Ratio of the sides (&Perimeters)?	Ratio of the areas of the triangles?	Corresponding sides (Fill in with $\parallel$ or $\perp$)	In a well-scaled dilation it will ALWAYS be true that...
$A'B' = \underline{3}\ AB$ $AB = \underline{\frac{1}{3}}\ A'B'$	1 : 3 (Pre-image:Image)	1 : 9 (Pre-image:Image) ★square the original ratio★	$AB \parallel A'B'$	Corresponding sides are in proportion Corresponding angles are $\cong$

SCENARIO #2: DILATING A FIGURE FROM A POINT ON THE FIGURE WHEN k > 1

STEPS:

1. Extend the line segments of triangle stemming from the center of dilation.
2. Using you compass, measure the distance from the center of dilation to one of the vertices. This represents a scale factor of 1.
3. Move the needle of your compass to the vertex on the triangle and make an arc on the extended line. This represents a scale factor of 2.
4. Each repetition of step 3 will represent a greater scale factor. Continue this until you meet your desired scale factor.
5. Repeat this process for each vertex of the triangle.
6. Connect new points.

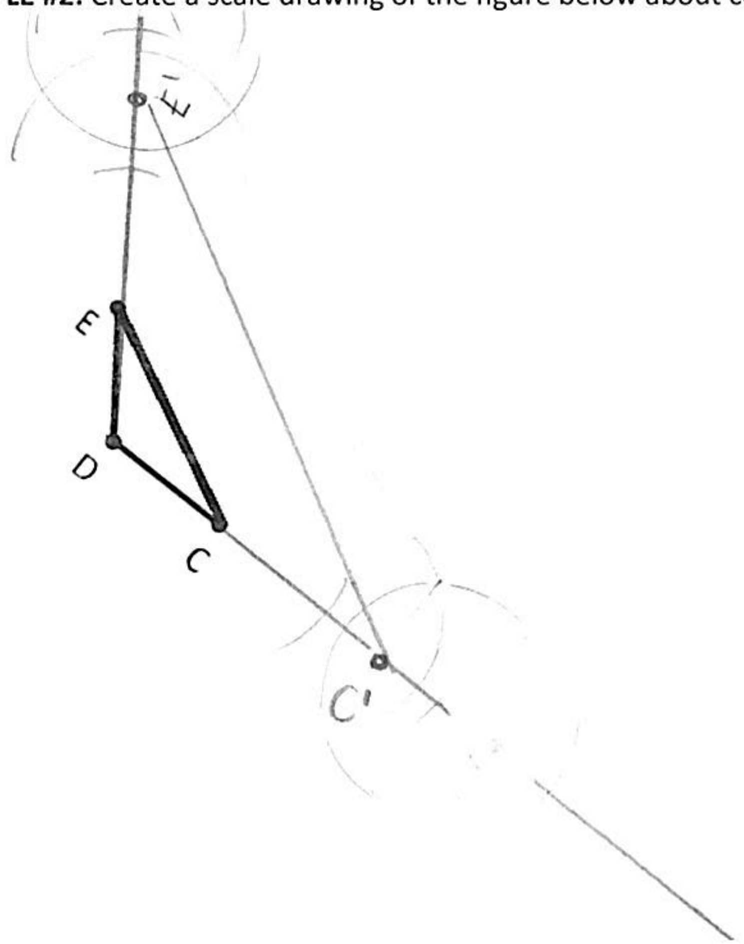
EXAMPLE #1: Construct a scale drawing of $\triangle ABC$ with a scale factor of $r = 2$, and with the center of dilation at point A.



Length of the Sides	Ratio of the <u>sides</u> (&<u>Perimeters</u>)?	Ratio of the <u>areas</u> of the triangles?	In a well-scaled dilation it will ALWAYS be true that...
$A'B' = \underline{2}\ AB$ $AB = \underline{1/2}\ A'B'$	1 : 2 (Pre-image:Image)	1 : 4 (Pre-image:Image) ★square ratio★	Corresponding sides are in proportion Corresponding **angles** are $\cong$

EXAMPLE #2: Create a scale drawing of the figure below about center ***D*** and scale factor $r = \frac{5}{2}$.

↳ 2.5
↓
what?!
$1/2 = \perp$ bisector

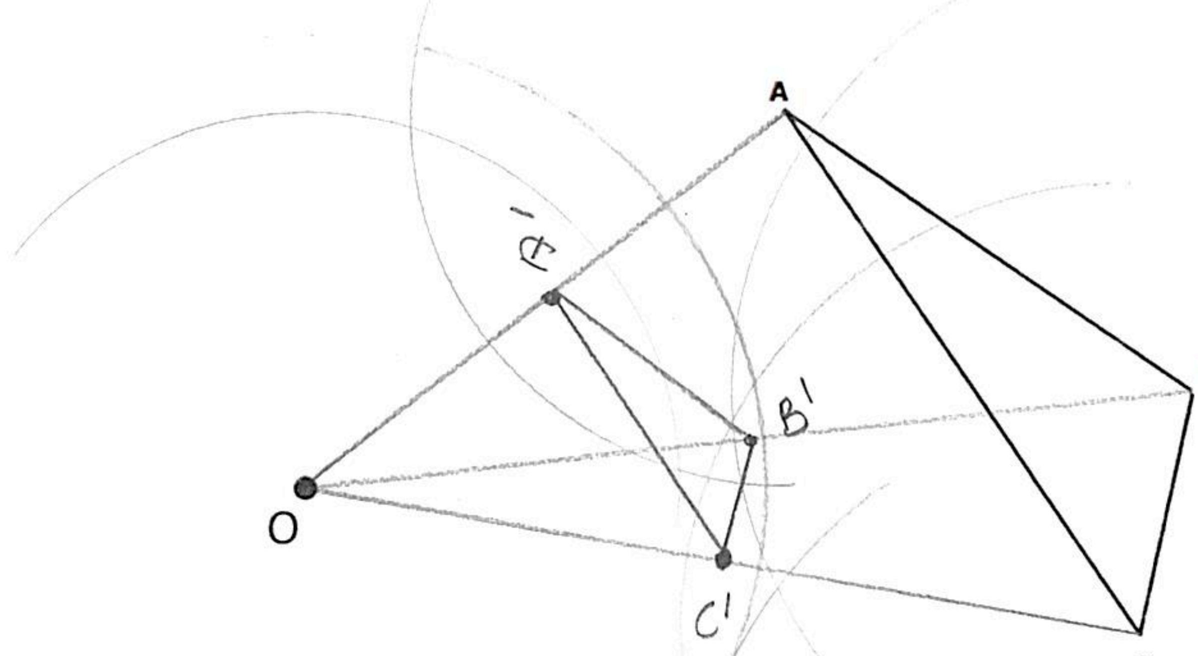


SCENARIO #3: DILATING A FIGURE FROM A POINT NOT ON THE FIGURE WHEN 0 < k < 1

STEPS:

1. Connect center of dilation to each vertex of the triangle.
2. Given a scale factor of $\frac{1}{2}$, using you compass, construct a perpendicular bisector from the center of dilation to a vertex. The midpoint represents your new point.
3. If your scale factor is $\frac{1}{4}$, using your compass, construct a second perpendicular bisector from the center of dilation to the new point obtained from step 2.
4. Repeat this process for each vertex of the triangle.
5. Connect new points.

EXAMPLE: Create a scale drawing of the figure below about center ***O*** and a scale factor of $r = \frac{1}{2}$.



EXAMPLE #2: Create a scale drawing of the figure below about center ***O*** and scale factor $r = \frac{1}{4}$. $\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$

2 ⊥ bisectors