Geometry Local Lomac 2015-2016	Date 3/24	due 4/5	**Similarity: Dilations Map Segments 11.6L**

Name _____ **Per_____**

LO: I can perform dilations and explain how they map segments, angles, rays, and lines.
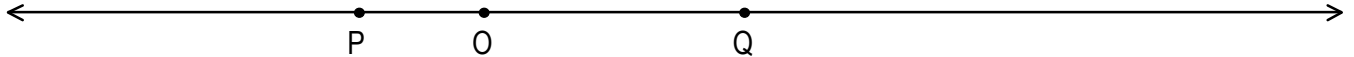
☐ **DO NOW**   On the back of this packet

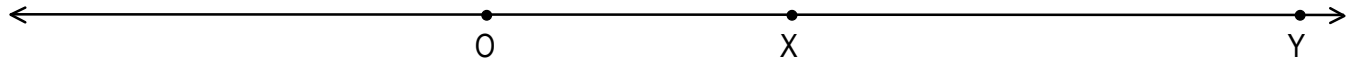☐ (1)   **Dilation of a segment about a center that is on the line . . .**

ruler,
compass   For each part, perform the indicated dilation.
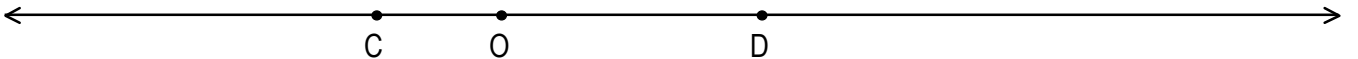
(a) $D_{O,2}(PQ)$

P   O   Q

(b) $D_{O,1/2}(XY)$

O   X   Y

(c) Describe what happens when you dilate a segment about a center point that is on the same line as the segment.

(d) $D_{O,1}(CD)$

C   O   D

(e) Describe what happens when you dilate a segment about a center point that is on the same line as the segment AND the scale factor is 1.

(f) For parts a, b, and d,

	(a)	(b)	(d)
verify that:	P'Q' = r (PQ)	X'Y' = r (XY)	C'D' = r (CD)

circle which happens:

$\overleftrightarrow{PQ} \parallel \overleftrightarrow{P'Q'}$ or $\overleftrightarrow{XY} \parallel \overleftrightarrow{X'Y'}$ or $\overleftrightarrow{CD} \parallel \overleftrightarrow{C'D'}$ or

$\overleftrightarrow{PQ} = \overleftrightarrow{P'Q'}$ $\overleftrightarrow{XY} = \overleftrightarrow{X'Y'}$ $\overleftrightarrow{CD} = \overleftrightarrow{C'D'}$

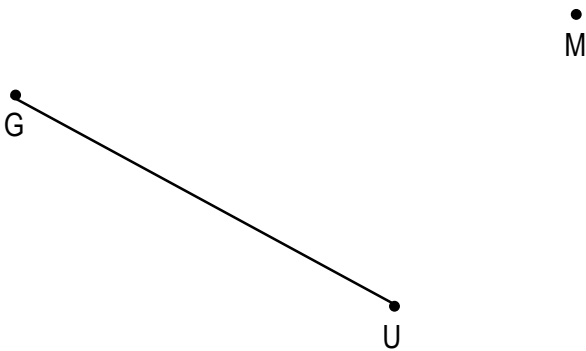☐ (2)   **Dilation of a segment about a center that is NOT on the line . . .**

ruler,
compass
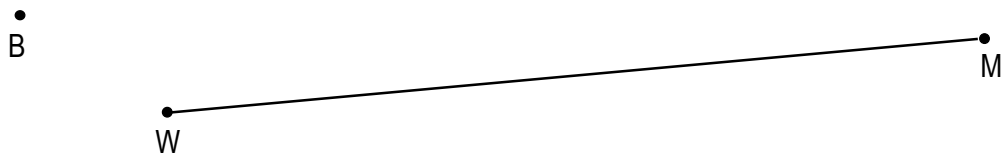For each part, perform the indicated dilation.

(a) $D_{J,3}(QB)$

Q

J

B

(b) $D_{M,1/4}(UG)$

M

G

U

(c) Describe what happens when you dilate a segment about a center point that is NOT on the same line as the segment.

(d) $D_{B,1}(MW)$

B

M

W

(e) Describe what happens when you dilate a segment about a center point that is NOT on the same line as the segment AND the scale factor is 1.

(f) For parts a, b, and d,

	(a)	(b)	(d)
verify that:	Q'B' = r (QB)	G'U' = r (GU)	M'W' = r (MW)
circle which happens:	$\overleftrightarrow{QB} \| \overleftrightarrow{Q'B'}$ or	$\overleftrightarrow{GU} \| \overleftrightarrow{G'U'}$ or	$\overleftrightarrow{MW} \| \overleftrightarrow{M'W'}$ or
	$\overleftrightarrow{QB} = \overleftrightarrow{Q'B'}$	$\overleftrightarrow{GU} = \overleftrightarrow{G'U'}$	$\overleftrightarrow{MW} = \overleftrightarrow{M'W'}$

☐ **(3)** **Dilation of a segment summary**

Complete each statement:

(1) A dilation maps a segment to a segment (circle one)   *always*   *sometimes*   *never*

(2) A dilation maps a segment to the same line when _____ or _____

_____.

(3) A dilation maps a segment to a parallel segment when _____

and _____.

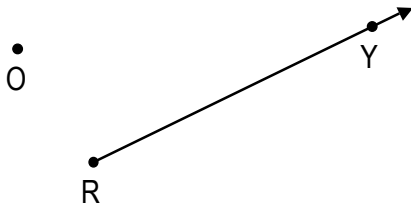(4) If segments of different lengths lie in the same plane, there is a dilation that maps one to the other

if and only if _____ or _____.

☐ **(4)** **Dilation of a ray or a line**

compass,
ruler

Predict what will happen when a ray is dilated: _____.

Dilate ray RY about center O with scale factor $r = \frac{3}{2}$.

•
O

Y

R

What happens when a ray is dilated? Dilating a ray results in _____

What would change if the center lies on the ray? _____

What would change if r = 1?_____

What happens when a line is dilated? Dilating a line results in _____

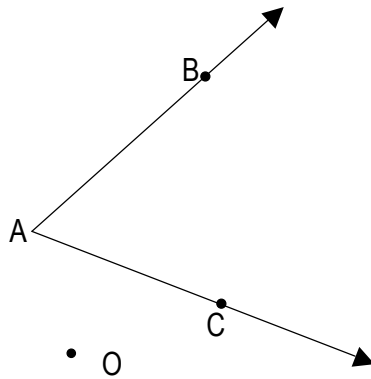What would change if the center lies on the line? _____

What would change if r = 1?_____

☐ (5)   **Dilation of an angle**

compass,
ruler

(a) Angles are formed by two _____ that share an endpoint (see picture if you aren't sure).

(b) Dilating a ray results in _____ (see #5).

(c) Dilate angle ABC below about point O with scale factor r = 2.

B•

A

C•

• O

(d) ___ ‖ ___ and ___ ‖ ___ because rays map to _____rays under dilation

(e) Label the intersection of ray AB and ray A'C' with the letter T.

(f) ∠BAC ≅ ∠BTC' because _____

(g) ∠B'A'C' ≅ ∠BTC' because _____
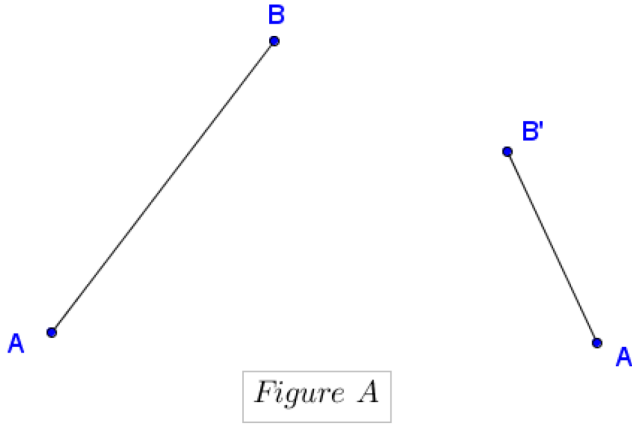
(h) ∠B'A'C' ≅ ∠BAC because _____

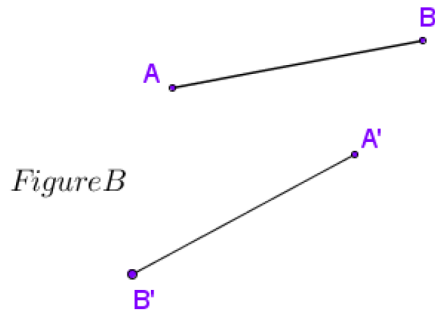(i) Dilating an angle results in an angle _____

☐ (6)   **Dilation Practice**

ruler,
compass

Only one of figures A, B, or C below contains a dilation that maps A to A' and B to B'. Explain for each figure why the dilation does or does not exist. For each figure, assume that AB ≠ A'B'.
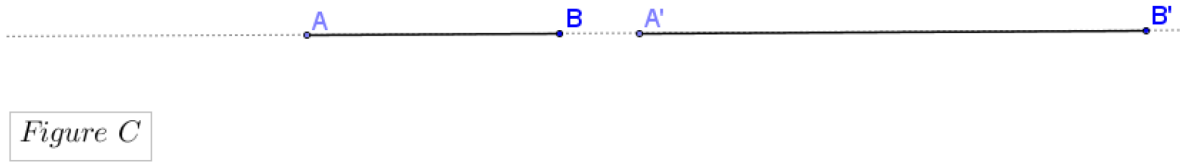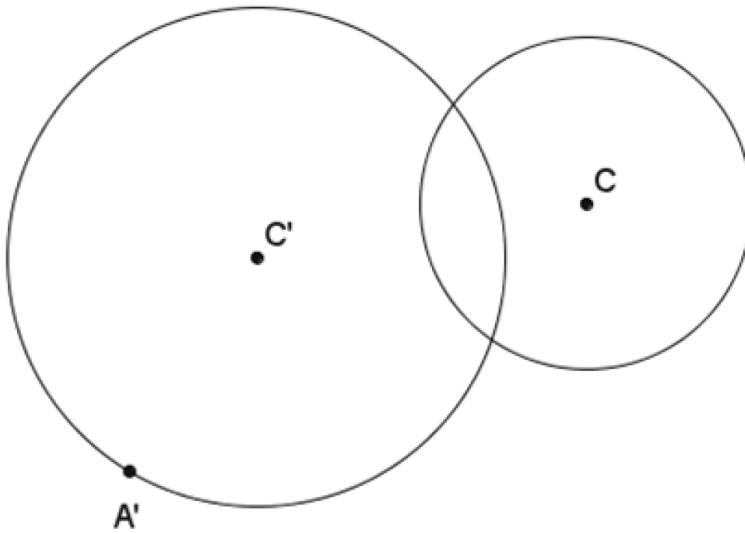
a.

B

B'

A

A'

Figure A

b.

A

B

A'

FigureB

B'

c.

A

B   A'

B'

Figure C

☐ (7) **Dilation practice**

ruler,
compass   In the picture below, the larger circle is a dilation of the smaller circle. Find the center of dilation O. (Use the parallel method to locate point A first – meaning, you know A'C' must be parallel to AC, so . . .)
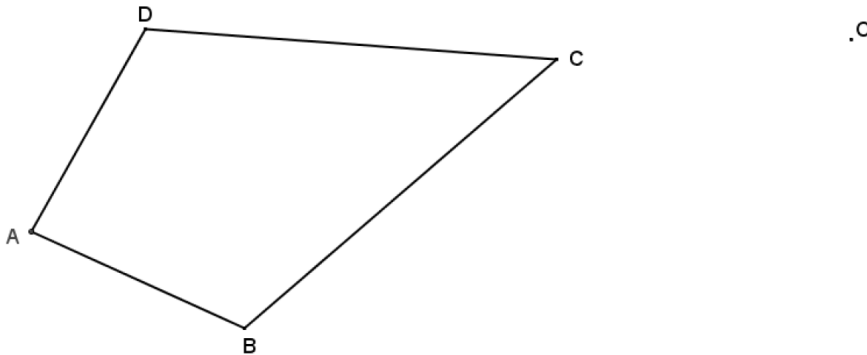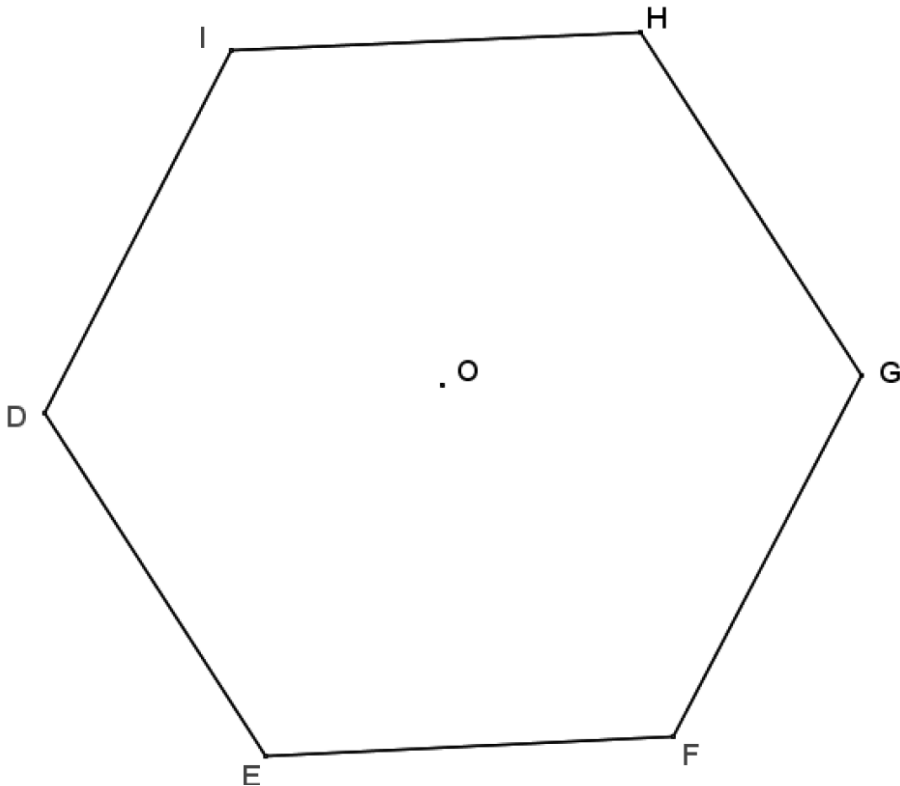
☐ (8) **Exit Ticket**

ruler   On the last page

☐ (9) **Homework:**

☐ (1) Dilate kite $ABCD$ from center O using a scale factor $r = 1\frac{1}{2}$.

Describe how the segments and angles of the original compare to those of the dilation.

☐ (2) Dilate hexagon $DEFGHI$ from center O using a scale factor of $r = \frac{1}{4}$.

Describe how the segments and angles of the original compare to those of the dilation.

☐ (13) **Homework:**
cont.

☐ (3) Read the lesson summary and draw sketches to illustrate the ideas.

> **Lesson Summary**
>
> ▪ Dilations map angles to angles of equal measure.
>
> ▪ Dilations map polygonal figures to polygonal figures whose angles are equal in measure to the corresponding angles of the original figure and whose side lengths are equal to the corresponding side lengths multiplied by the scale factor.

☐ (4) Find the value of x in each diagram below.

8   X

6   9

12

2

X

12   3

11

15
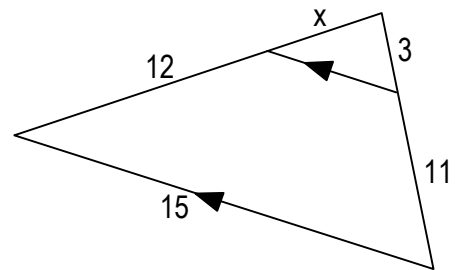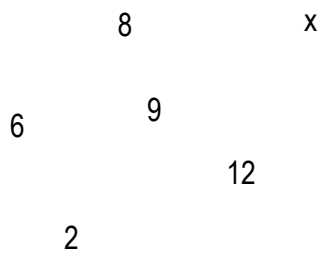
Exit Ticket   **Name**_____ **Date** _____ **Per**_____   **11.6L**

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:
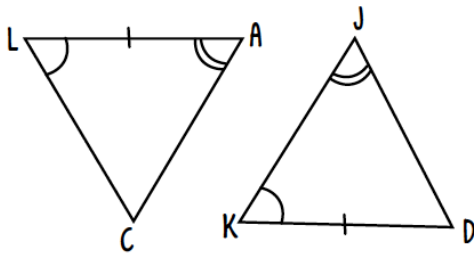
Dilate parallelogram $STUV$ from center O using a scale factor of $r = \frac{3}{4}$.
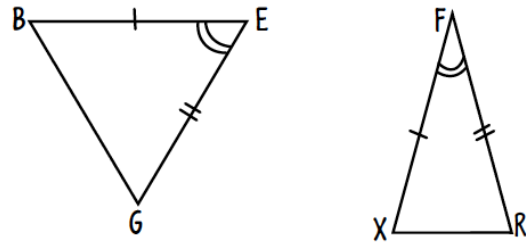
How does $m\angle T'$ compare to $m\angle T$?

T

U

S

V

O

DO NOW   Name_____ Date _____ Per_____   11.6L
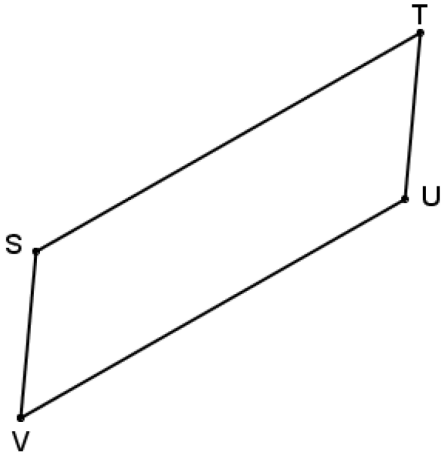
(1) Determine whether or not each pair of triangles are congruent. If yes, state the reason and name the triangles.

congruent?	yes no
reason	

△___ ≅ △___

congruent?	yes no
reason	

△___ ≅ △___

(2) Complete the statement

When I make a scale drawing by dilating, I can verify that I have made a scale drawing by _____

_____ *and* _____

(3) What is supposed to make you smile about the joke at right?
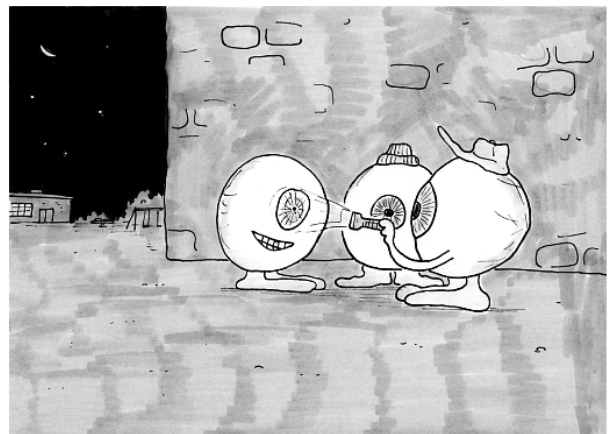
Late at night, all the young eyeballs would meet out behind the schoolyard to see who could dilate their pupils the most.