

Name: _____

Date: _____

UNIT 5

LESSON 1

AIM: WHAT IS A DILATION? WHAT IS A SCALE FACTOR?

Do Now: If you put a magnifying glass over the triangle below and enlarged it **10 times the original size**, what would the length of \overline{DG} be? What would the measure of $\angle D$ be?



What transformation is being represented by this description? _____

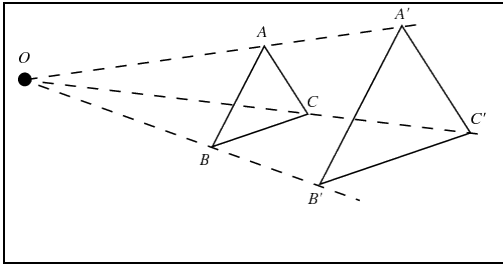
| | |
|-------------------|------------------------|
| DEFINITION | CHARACTERISTICS |
| EXAMPLE | NON-EXAMPLE |

RECALL: RIGID MOTIONS

- RIGID MOTIONS** are transformations that preserve _____ and _____ that produce _____ figures

| | | |
|--|-------------------------------------|---|
| <p>Translate</p> | <p>Reflect</p> | <p>Rotate</p> |
| <p>We TRANSLATE along _____ (UP, DOWN, LEFT or RIGHT)</p> | <p>We REFLECT over _____</p> | <p>We ROTATE around _____ by a certain number of _____ in either a CLOCKWISE or COUNTER- CLOCKWISE direction</p> |

- **DILATIONS** are transformations that preserve _____ but change _____ that produce _____ figures.



We **DILATE** about a _____ by a certain _____

$k > 1$: _____

$k = 1$: _____

$0 < k < 1$: _____

EXAMPLES:

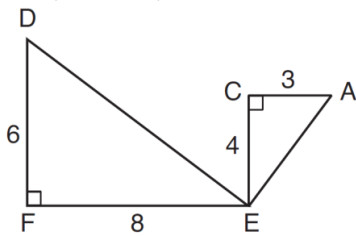
1. The vertices of $\triangle JKL$ have coordinates $J(5,1)$, $K(-2,-3)$, and $L(-4,1)$. Under which transformation is the image $\triangle J'K'L'$ *not* congruent to $\triangle JKL$?

- 1) a dilation with a scale factor of 1 centered at the origin
- 2) a counterclockwise rotation of 180° around the origin
- 3) a reflection over the x -axis
- 4) a dilation with a scale factor of 2 and centered at the origin

2. The image of $\triangle DEF$ is $\triangle D'E'F'$. Under which transformation will the triangles *not* be congruent?

- 1) a reflection through the origin
- 2) a dilation with a scale factor of 2, centered at the origin
- 3) a translation 4 units right and 2 units up.
- 4) A dilation with scale factor of 1, centered at D.

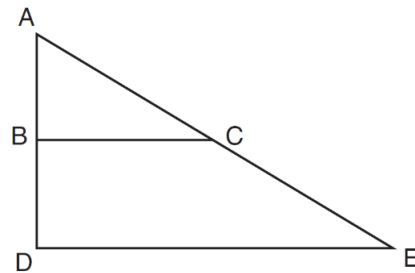
3. Given: $\triangle AEC$, $\triangle DEF$, and $\overline{FE} \perp \overline{CE}$



What is a correct sequence of similarity transformations that shows $\triangle AEC \sim \triangle DEF$?

- 1) a rotation of 180 degrees about point E followed by a horizontal translation
- 2) a counterclockwise rotation of 90 degrees about point E followed by a horizontal translation
- 3) a rotation of 180 degrees about point E followed by a dilation with a scale factor of 2 centered at point E
- 4) a counterclockwise rotation of 90 degrees about point E followed by a dilation with a scale factor of 2 centered at point E

4. The image of $\triangle ABC$ after a dilation of scale factor k centered at point A is $\triangle ADE$, as shown in the diagram below.

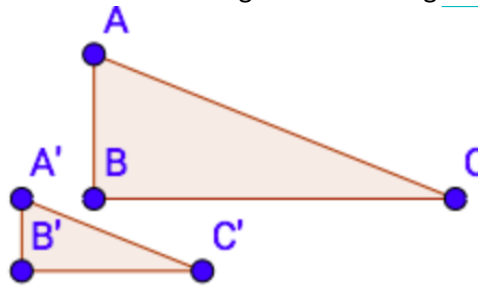


Which statement is always true?

- 1) $2AB = AD$
- 2) $\overline{AD} \perp \overline{DE}$
- 3) $AC = CE$
- 4) $\overline{BC} \parallel \overline{DE}$

| FINDING THE CENTER OF DILATION | FINDING THE SCALE FACTOR (k) |
|--|------------------------------|
| <ul style="list-style-type: none"> • Draw 2 _____ through 2 pairs of corresponding points from big to small (PAST small). • The _____ of these lines, is the center of dilation. | $k = \frac{NEW}{OLD}$ |

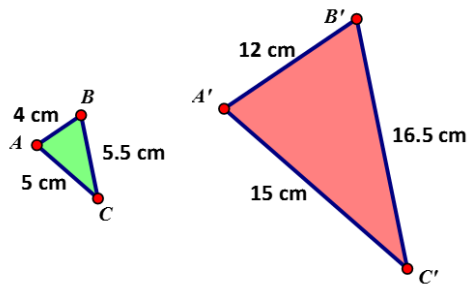
1. a) Determine the location of center O used for the following scaled drawing. ___



b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

c) What is the scale factor? (Using corresponding side names)

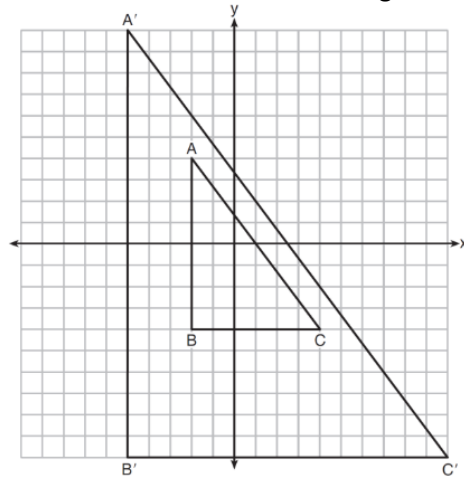
2. a) Determine the location of center O used for the following scaled drawing.



b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

c) What is the exact scale factor? (Use corresponding side lengths to determine)

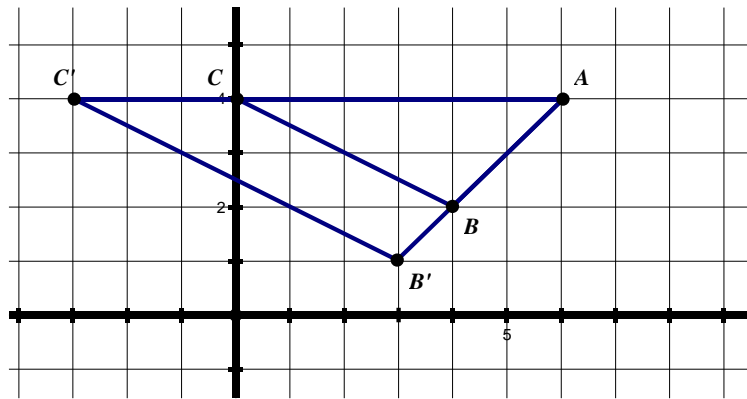
3. a) Determine the location of center O used for the following scaled drawing.



b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

c) What is the exact scale factor? (Use corresponding side lengths to determine)

4. a) Determine the location of the center used for the following scaled drawing.



b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

c) What is the exact scale factor? (Use corresponding side lengths to determine)

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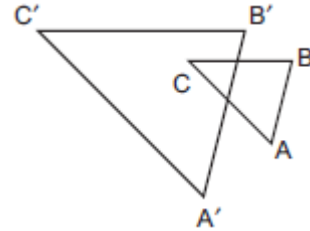
UNIT 5

LESSON 1

HOMEWORK

1. A triangle is dilated by a scale factor of 3 with the center of dilation at the origin. Which statement is true?
 - 1) The area of the image is nine times the area of the original triangle.
 - 2) The perimeter of the image is nine times the perimeter of the original triangle.
 - 3) The slope of any side of the image is three times the slope of the corresponding side of the original triangle.
 - 4) The measure of each angle in the image is three times the measure of the corresponding angle of the original triangle.

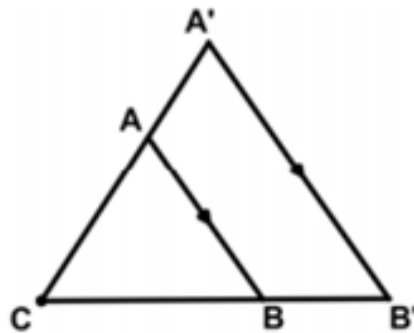
2. In the accompanying diagram, $\triangle ABC$ is similar to but not congruent to $\triangle A'B'C'$.



Which transformation is represented by $\triangle A'B'C'$?

- 1) rotation
- 2) translation
- 3) reflection
- 4) dilation

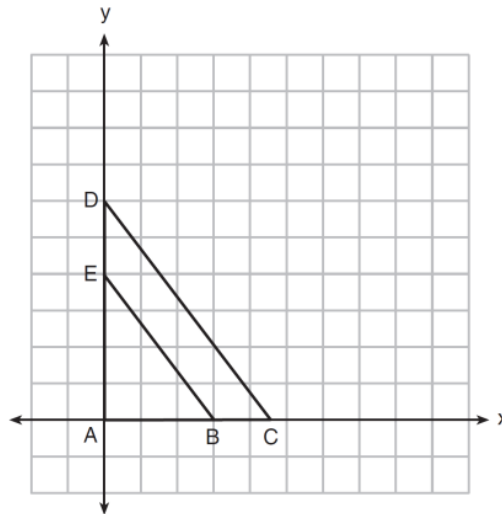
3. a) Determine the location of the center used for the following scaled drawing.



- b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

- c) What is the scale factor? (Using corresponding side names)

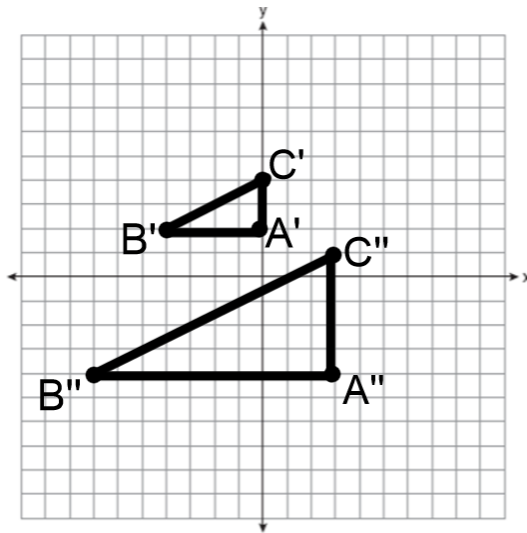
4. a) $\triangle ADC$ is dilated and maps to $\triangle AEB$. Determine the location of the center used for the following scaled drawing.



b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

c) What is the exact scale factor? (Use corresponding side lengths to determine)

5. a) $\triangle A'B'C'$ maps to $\triangle A''B''C''$. Determine the location of center O used for the following scaled drawing.



b) Is the scale factor between 0 and 1, or greater than 1? Explain your answer.

c) What is the exact scale factor? (Use corresponding side lengths to determine)