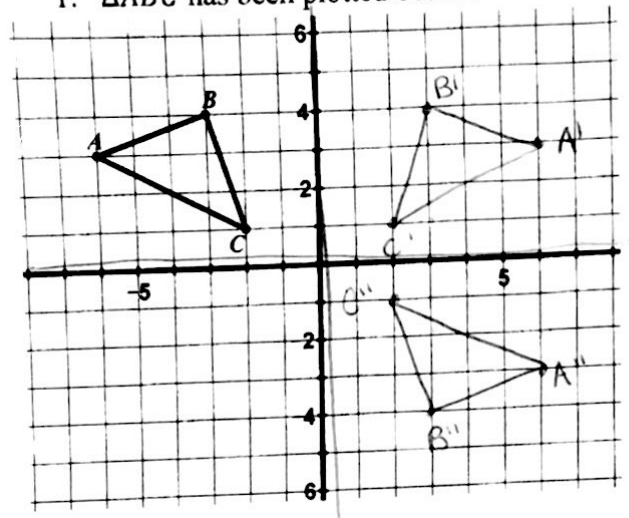Date:_____ Per._____

CWK # 4   _Series of Transformations_

The examples we have studied so far in this unit and the last we have only performed one transformation on a figure. We can also perform more than one transformation on a figure. In the following problems, you will perform a **sequence of transformations** on a figure.
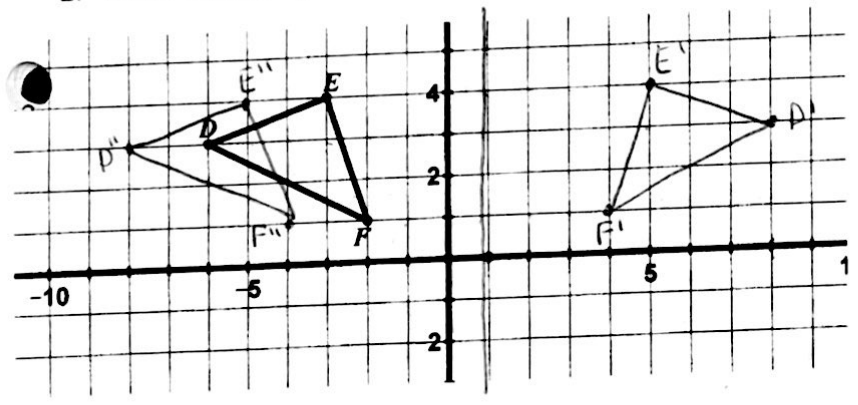
1. $\triangle ABC$ has been plotted below.

a. Reflect $\triangle ABC$ over the y-axis and label the image $\triangle A'B'C'$.

b. Reflect $\triangle A'B'C'$ over the x-axis and label the image $\triangle A''B''C''$.

c. What **one** transformation is the same as this double reflection?

    rotation 180° around origin
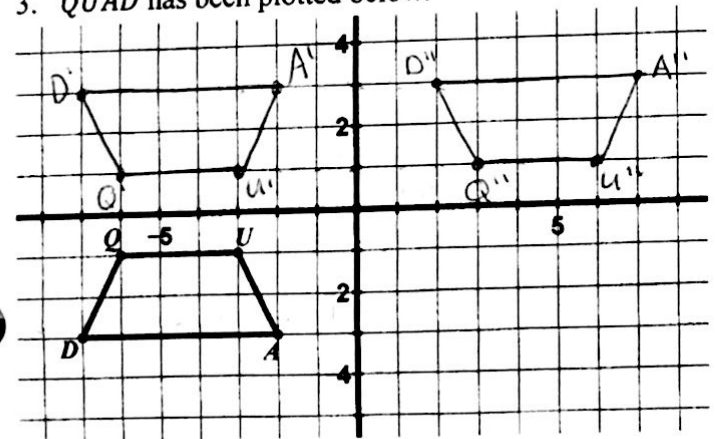
2. $\triangle DEF$ has been plotted below.

a. Reflect $\triangle DEF$ over the line $x = 1$ and label the image $\triangle D'E'F'$.

b. Reflect $\triangle D'E'F'$ over the y-axis and label the image $\triangle D''E''F''$.

c. What **one** transformation is the same as this double reflection?

    translation 2 left.

d. Write a coordinate rule for the transformation of $\triangle DEF$ to $\triangle D''E''F''$.

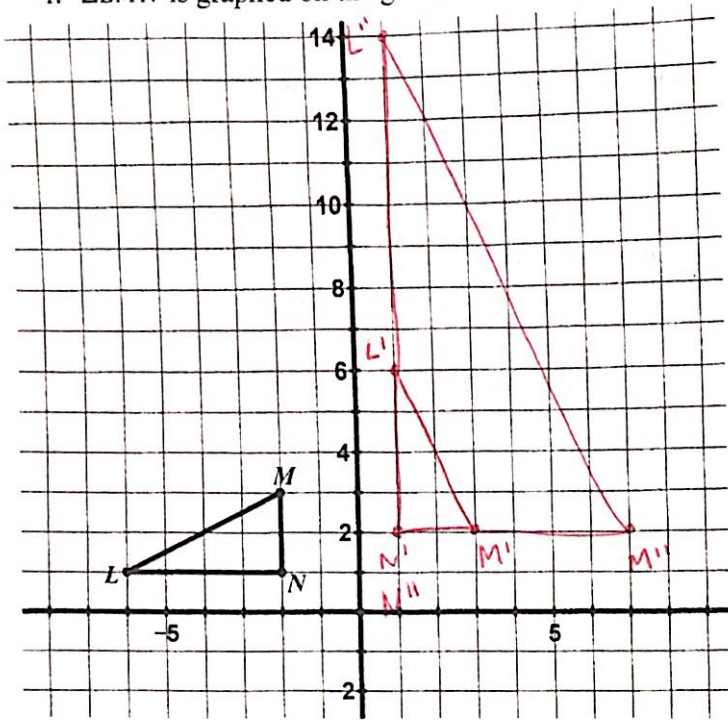 $(x,y) \rightarrow (x-2, y)$

3. $QUAD$ has been plotted below.

a. Reflect $QUAD$ over the x-axis and label the image $Q'U'A'D'$.

b. Translate $Q'U'A'D'$ according to the rule $(x,y) \rightarrow (x+9, y)$ label the image $Q''U''A''D''$.

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4. ΔLMN is graphed on the grid below.

a. Rotate ΔLMN 90°clockwise about the origin. Label the new triangle $\Delta L'M'N'$.

b. Dilate $\Delta L'M'N'$ by a scale factor of 3 with the center of dilation at $(1, 2)$. Label the new triangle $\Delta L''M''N''$.

c. Write a statement that shows the relationship between ΔLMN and $\Delta L'M'N'$.

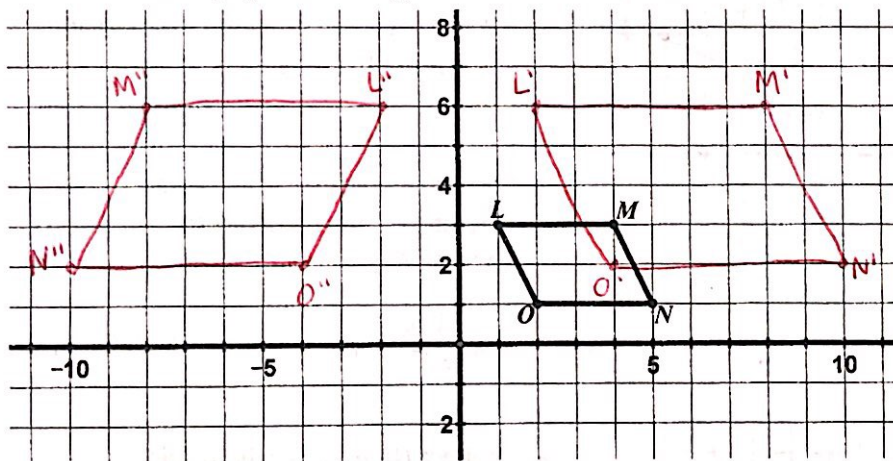$$\Delta LMN \cong \Delta L'M'N'$$

d. Write a statement that shows the relationship between $\Delta L'M'N'$ and $\Delta L''M''N''$.

$$\Delta L'M'N' \sim \Delta L''M''N''$$

e. List five other relationships between corresponding angles, sides, etc. that you know to be true based on the relationships in parts c and d.

5. $LMNO$ is graphed on the grid below.

a. Dilate $LMNO$ by a scale factor of 2 with the center of dilation at the origin. Label the new quadrilateral $L'M'N'O'$.

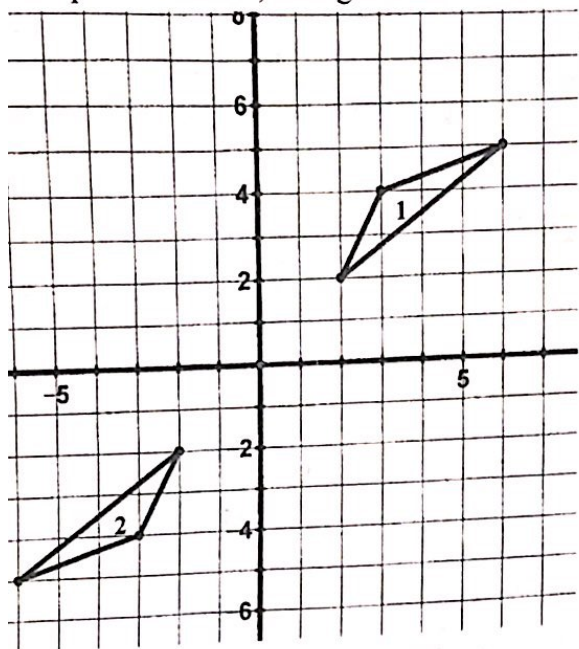b. Reflect $L'M'N'O'$ across the y-axis. Label the new quadrilateral $L''M''N''O''$.

c. Write a statement that shows the relationship between $LMNO$ and $L'M'N'O'$.

$$LMNO \sim L'M'N'O'$$

d. Write a statement that shows the relationship between $L'M'N'O'$ and $L''M''N''O''$.

$$L'M'N'O' \cong L''M''N''O''$$

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2

the picture below, triangle 1 has been transformed to obtain triangle 2.
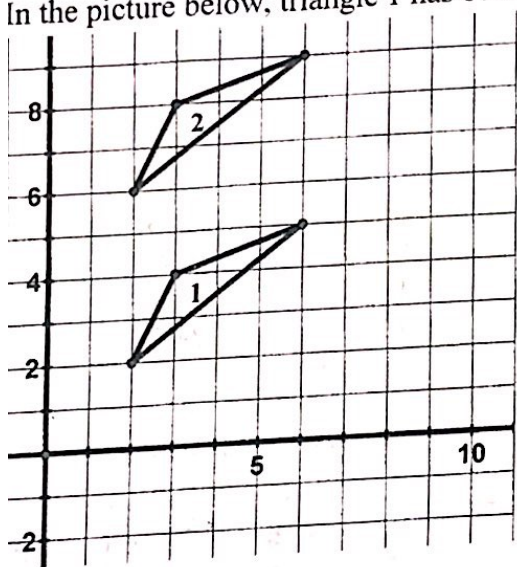
a. Which **one** transformation would carry triangle 1 onto triangle 2?

rotation 180° around (0,0)

b. Which **two** transformations in succession would carry triangle 1 onto triangle 2?

reflection across x & y axis

In the picture below, triangle 1 has been transformed to obtain triangle 2.

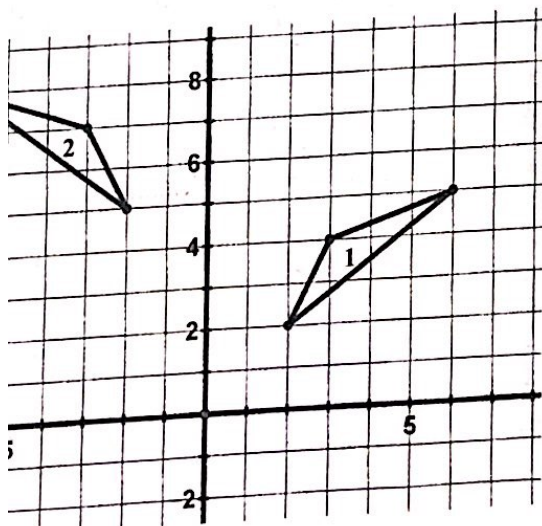a. Which **one** transformation would carry triangle 1 onto triangle 2?

translation down 4

b. Which **two** transformations in succession would carry triangle 1 onto triangle 2?

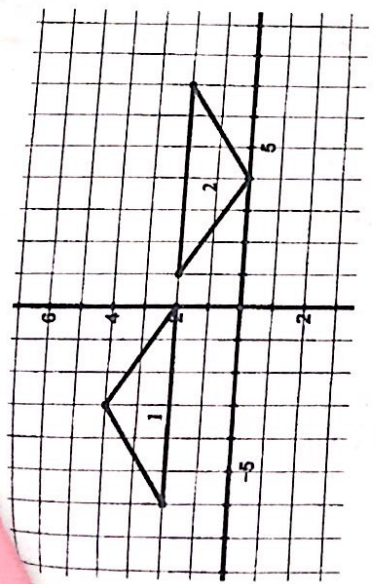reflection across x-axis and x = 2

reflection across x=2 & x = 4

Describe a transformation or sequence of transformations that would carry triangle 1 onto triangle 2.

reflect aross y-axis

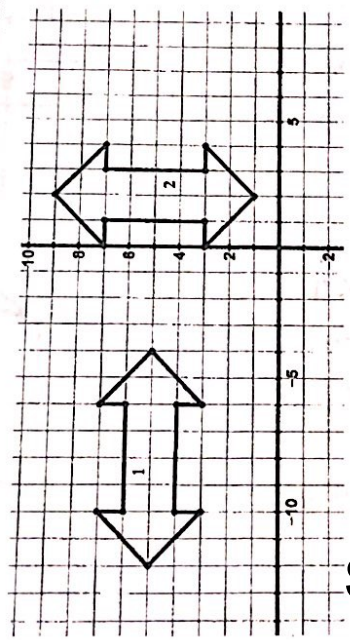translate up 3

3

5

1. Determine whether the following transformations or sequence of transformations will result in similar figures, congruent figures, or neither. Provide a justification for your answer.

a. $(x,y) \to (x - 6, y + 2)$ translates   **congruent**

b. $(x,y) \to (-x, y)$ followed by $(x,y) \to (2x, 2y)$ reflection / dilation   **Similar**

c. $(x,y) \to (2x, 3y)$ followed by a reflection across the x-axis   **neither**   dif scale factors

d. $(x,y) \to (x + 5, y + 5)$ followed by a 90° rotation counterclockwise about the origin   translate / rotate } rigid   **Congruent**

e. $(x,y) \to (\frac{1}{4}x, \frac{1}{4}y)$ followed by $(x,y) \to (y,x)$ dilation / reflect   **Similar**

f. $(x,y) \to (x, y + 4)$ followed by a 180° rotation clockwise about the origin   rotation / translation } rigid   **Congruent**

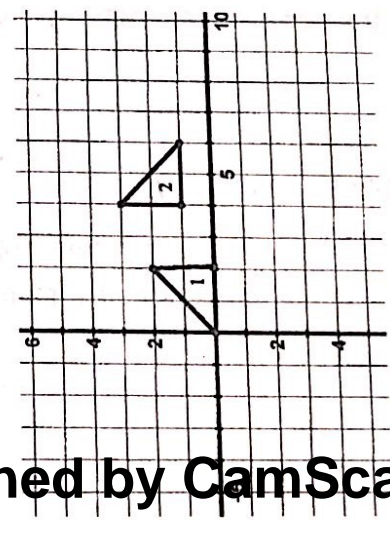...that would carry triangle 1 onto triangle 2.

rotation 180°
OR
reflection across
2 lines (horiz & vert)

8. Describe a transformation or sequence of transformations that would carry figure 1 onto figure 2 below.

rotation 90°

9. Describe a transformation or sequence of transformations that would carry triangle 1 onto triangle 2 below.

rotation
OR
reflection & translation

4

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