

Name: Key

Class: _____

M8-U3: Notes & HW #5 - Practice

Date: _____

1. Find the coordinates of the image $ABCD$ with vertices $A(0, 0)$, $B(0, 3)$, $C(3, 3)$, and $D(3, 0)$ after a dilation with a scale factor of $\frac{4}{3}$.

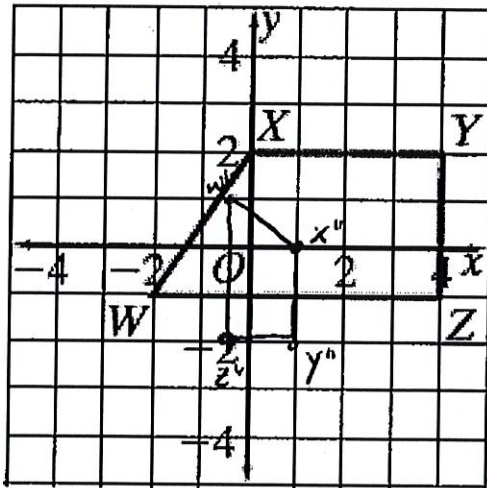
$$A'(0, 0)$$

$$B'(0, 4)$$

$$C'(4, 4)$$

$$D'(4, 0)$$

2. a) Find the coordinates and graph the image of quadrilateral $WXYZ$ after a dilation about the origin with a scale factor of $\frac{1}{2}$. b) If the image was rotated 90° clockwise, what would be the coordinates of X'' ?



$$(x, y) \rightarrow \left(\frac{x}{2}, \frac{y}{2}\right) \rightarrow (y, -x)$$

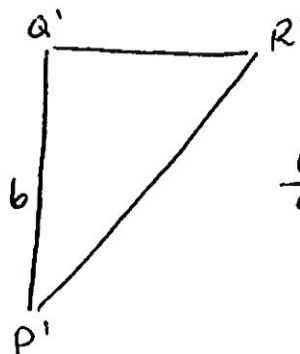
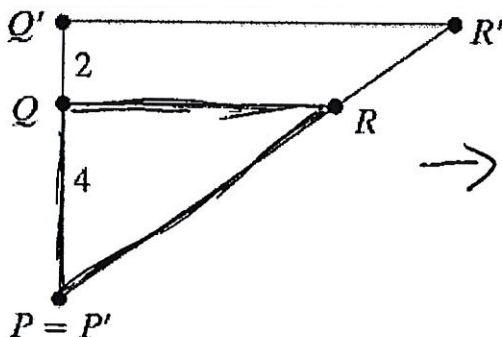
$$W(-2, -1) \rightarrow W'(-1, -\frac{1}{2}) \rightarrow W''(-\frac{1}{2}, 1)$$

$$X(0, 2) \rightarrow X'(0, 1) \rightarrow X''(1, 0)$$

$$Y(4, 2) \rightarrow Y'(2, 1) \rightarrow Y''(1, -2)$$

$$Z(4, -1) \rightarrow Z'(2, -\frac{1}{2}) \rightarrow Z''(-\frac{1}{2}, -2)$$

3. $\Delta Q'P'R'$ is a dilation of ΔQPR . Find the scale factor. Is it an enlargement or a reduction?

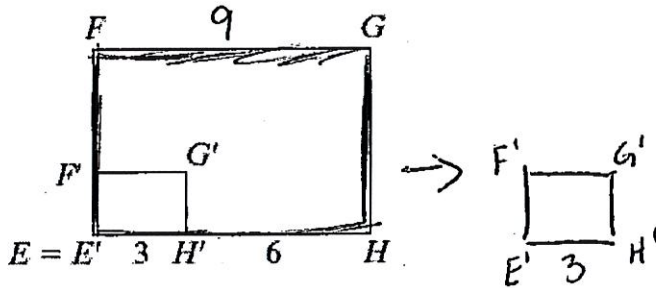


$$\frac{6}{4} = \left(\frac{3}{2}\right)$$

Enlargement

$$\frac{\text{image}}{\text{pre-image}} = \frac{\text{new}}{\text{old}}$$

4. Figure $EFGH$ shows the outline of a yard. Figure $E'F'G'H'$ is a doghouse. Figure $E'F'G'H'$ is a dilation of figure $EFGH$. Find the scale factor. Is it an enlargement or a reduction?

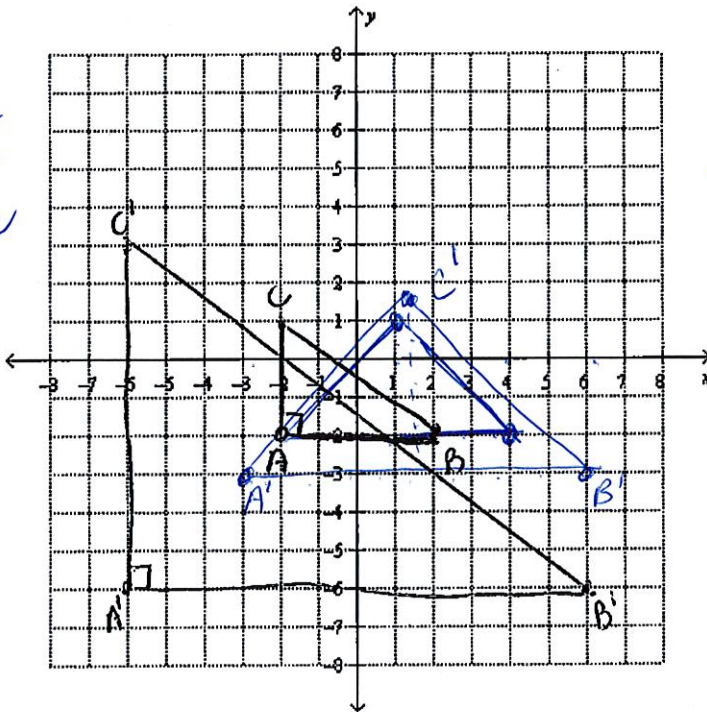


$$\frac{3}{9} = \frac{1}{3}$$

Reduction

5. A triangle has coordinates $A(-2, -2)$, $B(2, -2)$, and $C(1, 1)$. Graph its image $A'B'C'$ after a dilation with a scale factor $\frac{3}{2}$. Give the coordinates of $A'B'C'$. What parts are congruent? Explain. How do the areas compare? Explain.

See Blue Pen Answer Here



$$(x, y) \rightarrow \left(\frac{3x}{2}, \frac{3y}{2}\right)$$

$$A(-2, -2) \rightarrow A'(-3, -3)$$

$$B(2, -2) \rightarrow B'(6, -3)$$

$$C(1, 1) \rightarrow C'\left(\frac{3}{2}, \frac{3}{2}\right)$$

$$A(-2, -2) \rightarrow A'(-3, -3)$$

$$B(4, -2) \rightarrow B'(6, -3)$$

$$C(1, 1) \rightarrow C'\left(\frac{3}{2}, \frac{3}{2}\right)$$

$$\text{Area of Triangle} = \frac{1}{2} BH$$

Corresponding \angle 's are \cong . $\angle A \cong \angle A'$
 $\angle B \cong \angle B'$
 $\angle C \cong \angle C'$
 Dilations don't change angle size, only side lengths.

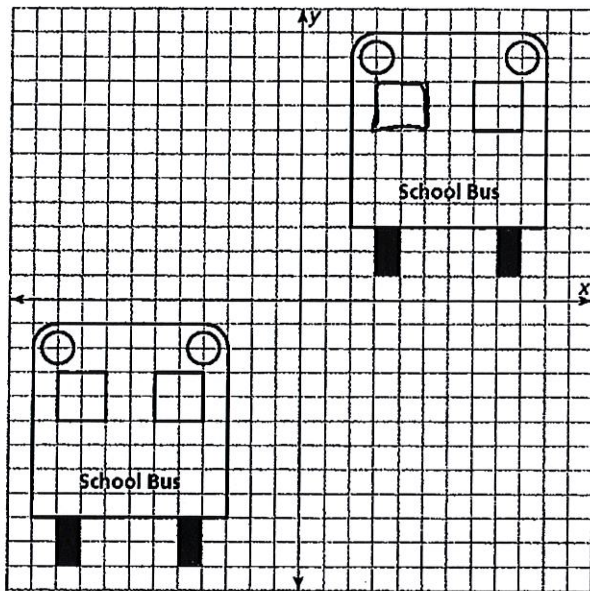
$$\Delta ABC = \frac{3(4)}{2} = 6 \text{ sq units} \quad \frac{1}{2}(6)(3) = 9$$

$$\Delta A'B'C' = \frac{9(12)}{2} = 54 \text{ sq units}$$

$$\frac{1}{2}(9)(4.5) = 20.25$$

The image's area is 2.25 times longer than the original. 11.25 units or 2.25 times

6. A graphic artist tried to translate a copy of the original school bus drawing below, but he accidentally left one of the windows behind.



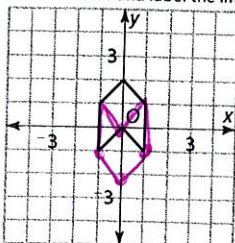
- a) Make a table showing the coordinates of the vertices of the left window of the original bus and the coordinates of the vertices that this window should have in the image.

(x, y)	\rightarrow	$(x+13, y+12)$
$(-10, -3)$	\rightarrow	$(3, 9)$
$(-8, -3)$	\rightarrow	$(5, 9)$
$(-8, -5)$	\rightarrow	$(5, 7)$
$(-10, -5)$	\rightarrow	$(3, 7)$

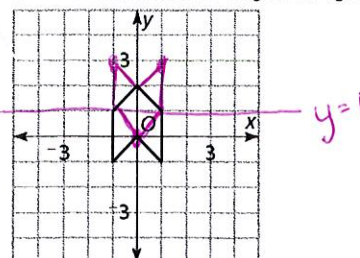
- b) Describe the translation so someone else could start with the drawing of the original bus in the bottom left-hand corner and draw the correct image shown in the upper right-hand corner.

The image is 13 units right
 & 12 units up

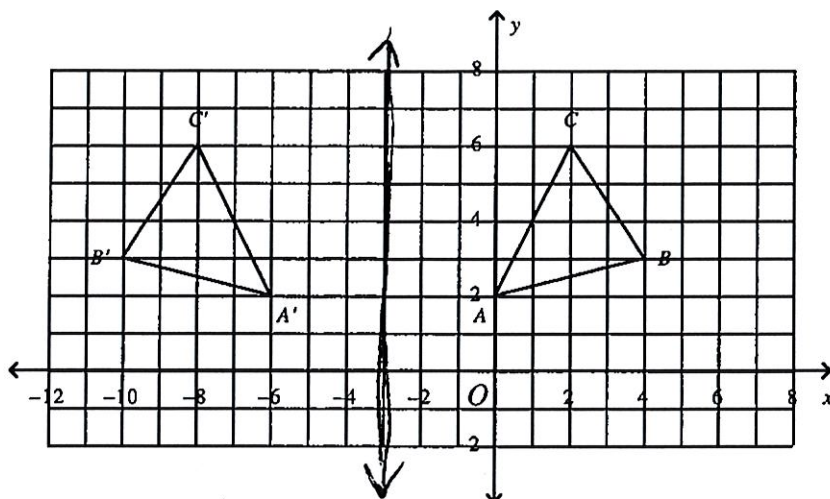
7. Draw and label the image of the figure after a reflection over the x-axis.



8. Draw and label the image of the figure after a reflection over the line $y = 1$.

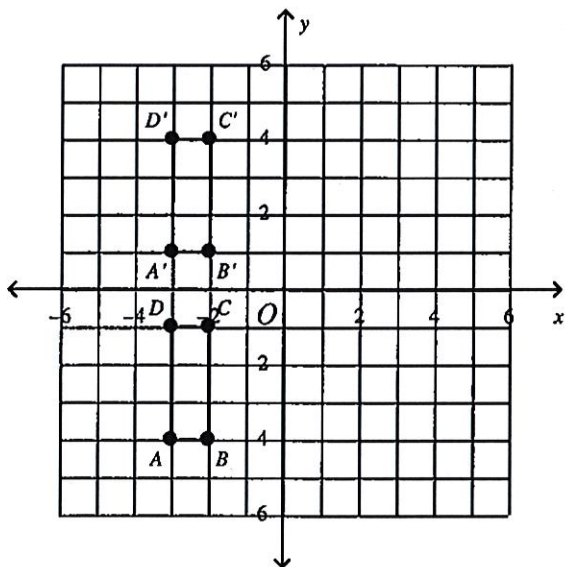


9. Based on the given drawing, determine the specific transformation.



Reflection over
the line
 $x = -3$
or reflect over
y-axis &
go left 6

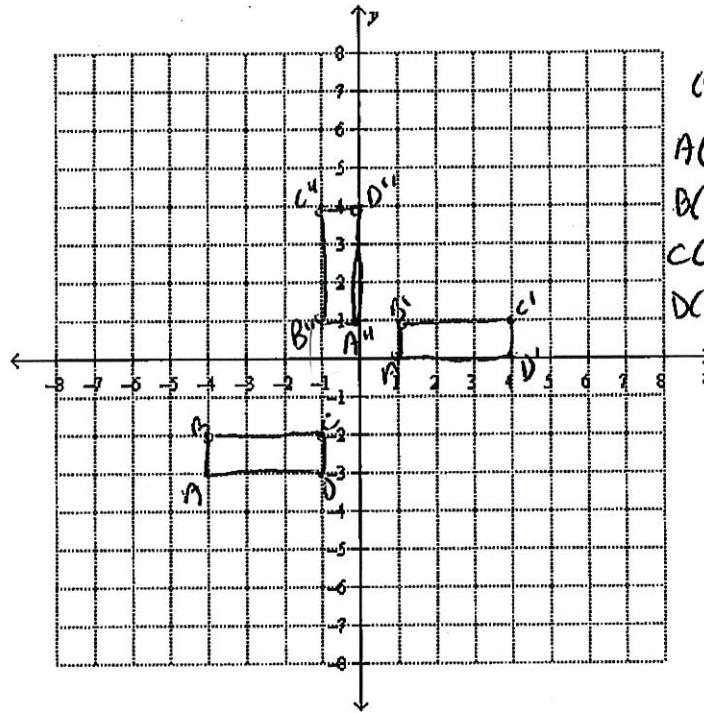
10. Based on the given drawing, determine the specific transformation.



translation
using the rule
 $(x, y) \rightarrow (x, y + 4)$

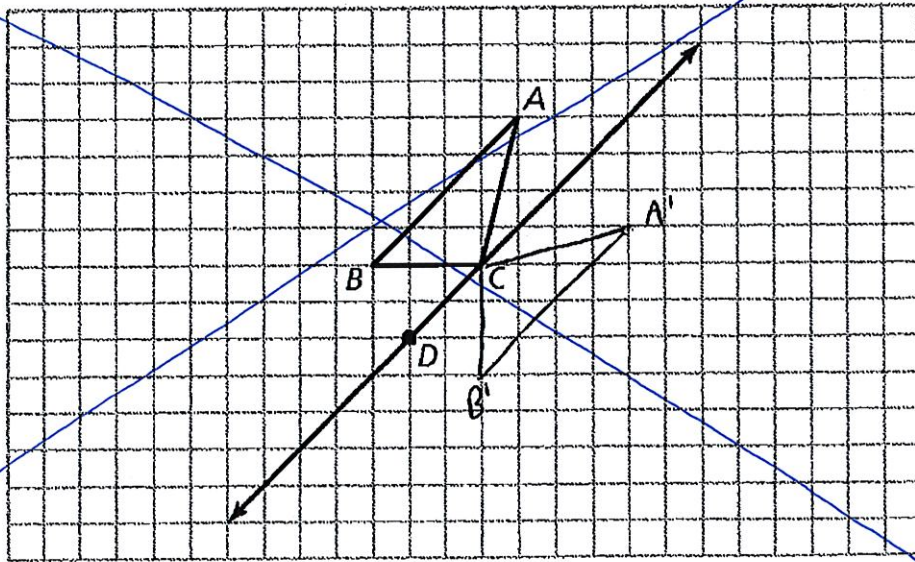
This is NOT
reflection. Be careful
on what specific
points are
moving
where

11. Rectangle $ABCD$ has vertices $A(-4, -3)$, $B(-4, -2)$, $C(-1, -2)$, and $D(-1, -3)$. Graph $ABCD$ and its translation 5 units to the right and 3 units up. Then rotate the image 90° counterclockwise, label the resulting figure appropriately.



$(x, y) \rightarrow (x+5, y+3) \rightarrow (-y, x)$
 $A(-4, -3) \rightarrow A'(1, 0) \rightarrow A''(0, 1)$
 $B(-4, -2) \rightarrow B'(-1, 0) \rightarrow B''(-1, 1)$
 $C(-1, -2) \rightarrow C'(4, 0) \rightarrow C''(-1, 4)$
 $D(-1, -3) \rightarrow D'(4, 0) \rightarrow D''(0, 4)$

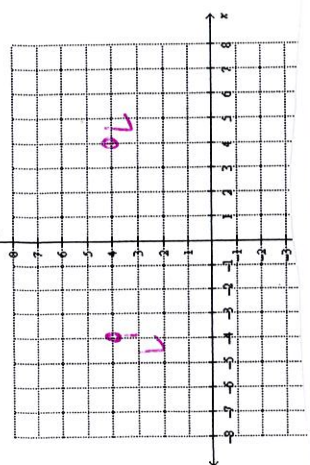
12. Reflect triangle ABC over the line shown.



13

12. Is rotating the point $(4, 4)$ 90° about the origin the same as reflecting the point over the x -axis? Explain.

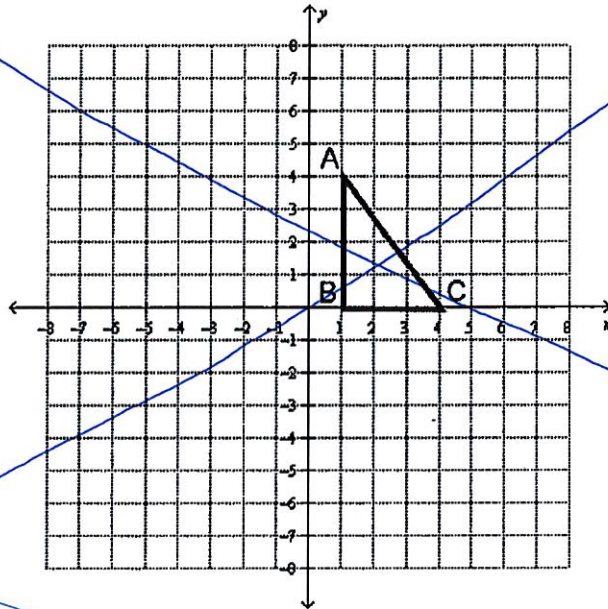
No, it's the same as reflecting over the y -axis



13.

What single transformation is equivalent to a reflection in the y -axis, followed by a reflection in the x -axis, followed by a reflection in the y -axis?

14

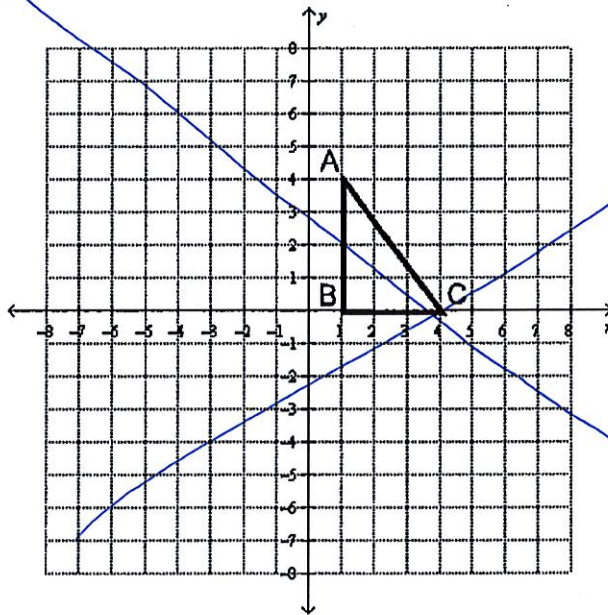


X-axis reflection

14

What single transformation is equivalent to a reflection in the x -axis, followed by a reflection in the y -axis?

15



180° rotation
in either
direction

Multiple Choice:

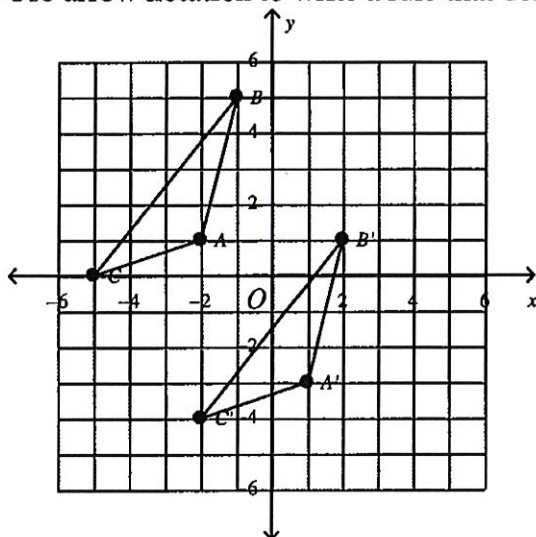
15. ¹⁶ The width of a picture is 20 cm. Using a color copier, you reduce the width of the picture to 5 cm. What is the scale factor of the dilation?

- a) 5 b) $\frac{1}{5}$ c) 4 **d) $\frac{1}{4}$**

16. ¹⁷ Which translation below is NOT described by the rule $(x, y) \rightarrow (x + 2, y - 3)$?

- a) $(3, -2) \rightarrow (5, -5)$ b) $(-4, 1) \rightarrow (-2, -2)$
c) $(0, 4) \rightarrow (2, 1)$ **d) $(1, -5) \rightarrow (3, -2)$**

17. ¹⁸ Use arrow notation to write a rule that describes the translation shown on the graph.



- a) $(x, y) \rightarrow (x + 3, y - 4)$** b) $(x, y) \rightarrow (x + 3, y + 4)$
c) $(x, y) \rightarrow (x - 3, y - 4)$ d) $(x, y) \rightarrow (x - 3, y + 4)$

18. At the half-time show, a marching band marched in formation. The lead drummer started at a point with coordinates (3, 4) and moved 3 steps down and 4 steps left.

- a. Write a rule to describe the translation
 b. What were the coordinates of the drummer's final position?

- a) $(x, y) \rightarrow (x - 4, y - 3); (-1, 1)$ b) $(x, y) \rightarrow (x + 4, y + 3); (7, 7)$
 c) $(x, y) \rightarrow (x - 4, y + 3); (-1, 1)$ d) $(x, y) \rightarrow (x + 4, y - 3); (7, 1)$

19. Suppose a constellation of stars is plotted on a coordinate plane. The coordinates of one star are (-2, 1). The star is translated up 5 units. What are its new coordinates?

- a) (-2, 6) b) (-7, 1) c) (3, 1) d) (-2, -4)

20. Rectangle ABCD has vertices A(-3, 1), B(-3, 2), C(-2, 1), and D(-2, 2). Graph ABCD and its translation 2 units to the right and 4 units down.

