

Math 2

Unit 1 – Geometric Transformations

Unit Test Review

Name Key

Date _____ Pd _____

- For each transformation, state the coordinates for each:

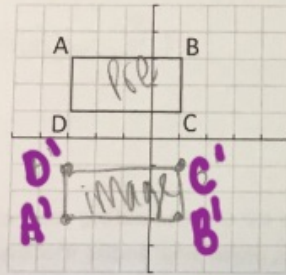
	Image of (x, y)	Image of $(1, 4)$	Image of $(-2, 7)$
1. Reflect over y – axis	$(-x, y)$	$(-1, 4)$	$(2, 7)$
2. Reflect over x – axis	$(x, -y)$	$(1, -4)$	$(-2, -7)$
3. Reflect over $y = x$	(y, x)	$(4, 1)$	$(7, -2)$
4. Reflect over $y = -x$	$(-y, -x)$	$(-4, -1)$	$(-7, 2)$
5. Rotate 90° clockwise about the origin	$(y, -x)$	$(4, -1)$	$(7, 2)$
6. Rotate 90° counterclockwise about the origin	$(-y, x)$	$(-4, 1)$	$(-7, -2)$
7. Rotate 180° about the origin	$(-x, -y)$	$(-1, -4)$	$(2, -7)$
8. Rotate 270° about the origin	$(x, -y)$	$(1, -4)$	$(-2, 7)$

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- For each of the following, graph and label the image for each transformation described.
- Then write using the correct notation

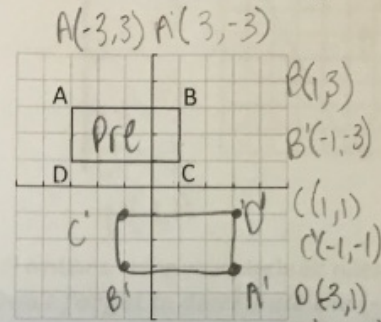
- For each of the following, graph and label the image for each transformation described.
- Then write using the correct notation.

9. Reflect over the x - axis



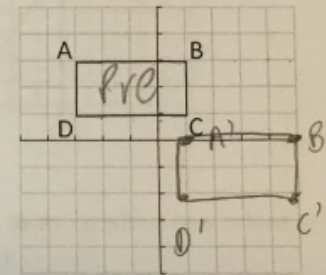
$R_{x\text{axis}}$

10. Rotate 180° about the origin



R_{180}

11. Translate right 4 units & down 3 units

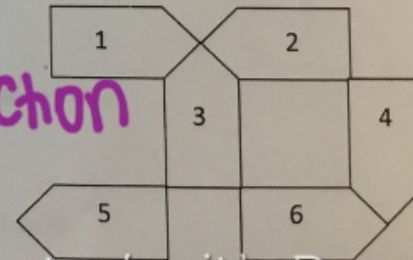


$(x, y) \rightarrow (x+4, y-3)$

- State whether the specified pentagon is mapped to the other pentagon by a **reflection, translation, or rotation**

12. Pentagon 1 to Pentagon 3
13. Pentagon 5 to Pentagon 6
14. Pentagon 2 to Pentagon 5
15. Pentagon 1 to Pentagon 2
16. Pentagon 4 to Pentagon 6

rotation
~~translation~~
reflection
translation
reflection
rotation



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- Perform each of the transformations using the points below for #16-19. .

$(7, -4)$ $(0, 6)$ $(-2, 3)$

<p>17. Reflect over the y - axis</p> <p>$(-7, -4)(0, 6)(2, 3)$</p>	<p>19. Rotate 90° counter-clockwise</p> <p>$(-4, 2)$ $(4, 7) (-6, 0) (-3, -2)$</p>
<p>18. Reflect over the line $y = -x$</p> <p>$(4, -7)(-6, 0)(-3, 2)$</p>	<p>20. Dilate by a scale factor $r = \frac{1}{2}$</p> <p>$(35, -2)(0, 3)(-1, 1.5)$</p>

- Answer each of the following.

21. $\triangle ABC$ has vertices $A(5, -2)$, $B(-4, 0)$, $C(7, 1)$.

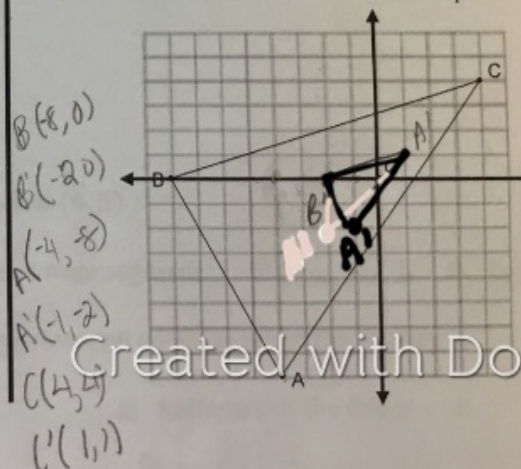
Find the coordinates of the image of the triangle if it is dilated by a scale factor $r = 3$.

$A'(\underline{15}, \underline{-6})$

$B'(\underline{-12}, \underline{0})$

$C'(\underline{21}, \underline{3})$

21. Dilate $\triangle ABC$ using a scale factor $r = \frac{1}{4}$.

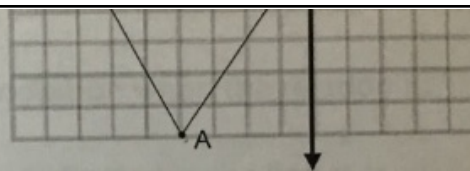


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$C(21, 3)$

$A(-1, 2)$
 $C(4, 4)$
 $P(1, 1)$



22. For each problem, there is a composition of motions. Using your algebraic rules, come up with a new rule after both transformations have taken place. **** Don't forget to distribute the (-)**

a. Translate a triangle 5 units left and 3 units up, and then reflect the triangle over the x - axis.

$$(x, y) \Rightarrow (x-5, y+3) \Rightarrow (x-5, -y-3)$$

b. Translate a triangle 2 units right and 7 units down, and then rotate 90° clockwise.

$$(x, y) \Rightarrow (x+2, y-7) \Rightarrow (y-7, -x-2)$$

c. Rotate a triangle 90 degrees counterclockwise, and then reflect in the line $y = x$.

$$(x, y) \Rightarrow (-y, x) \Rightarrow (x, -y)$$

d. Reflect in the line $y = -x$, and then translate right 4 units and down 2 units.

$$(x, y) \Rightarrow (-y, -x) \Rightarrow (-y+4, -x-2)$$

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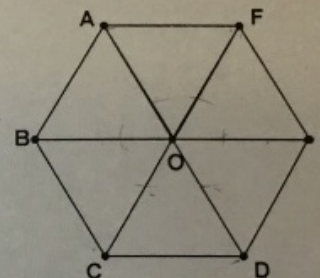
23. The diagonals of *Regular Hexagon ABCDEF* form six equilateral triangles as shown.

Fill in the correct letter after the given transformation:

a. Rotate 60° clockwise: $E \rightarrow$ D

1 turn

$\frac{360}{6} = 60^\circ$ central angle



b. Rotate 60° counter-clockwise: $D \rightarrow$ E

1 turn

c. Rotate 120° clockwise: $F \rightarrow$ D

2 turns

d. Rotate 300° counter-clockwise: $E \rightarrow$ D

5 turns

e. Rotate 60° clockwise: C $\rightarrow B$

1 turn

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24. Given a line segment with endpoints $(1, -2)$ and $(4, 5)$

A) State the domain and range of the pre-image segment. D: $(1, 4)$ R: $(-2, 5)$

4. Given a line segment with endpoints $(1, -2)$ and $(4, 5)$

A) State the **domain and range** of the pre - image segment. D: $[1, 4]$ R: $[-2, 5]$

B) State the domain and range of the image **interval notation** when the relation is:

$(x, y) \rightarrow (x+1, y+4)$ a) Translated right 1 and up 4:

D: $[2, 5]$

R: $[2, 9]$

d) Reflected in the line $y = x$:

D: $[-2, 5]$

R: $[1, 4]$

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

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

b) Reflected in the $x - axis$: $(x, y) \rightarrow (x, -y)$

D: $[1, 4]$

R: $[-5, +2]$

e) Rotated 90° :

D: $[-5, +2]$

R: $[1, 4]$

c) Reflected in the $y - axis$: $(x, y) \rightarrow (-x, y)$

D: $[-4, -1]$

R: $[-2, 5]$

f) Dilated by a factor of 5 with a center of $(0, 0)$:

D: $[5, 20]$

R: $[-10, 25]$

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