Math 2 – Honors **Unit 1 – Geometric Transformations Unit Review**

- Name_____ 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 $y - axis$			
2. Reflect over $x - axis$			
3. Reflect over $y = x$			
4. Reflect over $y = -x$			
5. Rotate 90° <i>clockwise</i> about the origin			
6. Rotate 90° <i>counterclockwise</i> about			
the origin			
7. Rotate 180° about the origin			
8. Rotate 270° about the origin			

- For each of the following, graph and label the image for each transformation described. ٠
- Then write using the correct notation. ٠
- 8. Reflect over the line y = -1 9. Rotate 180° about the origin
- 10. Translate right 4 units & down 3 units







- State whether the specified pentagon is mapped to the other pentagon by a reflection, translation, or rotation
- 11. Pentagon 1 to Pentagon 3
- 12. Pentagon 5 to Pentagon 6
- 13. Pentagon 2 to Pentagon 5
- 14. Pentagon 1 to Pentagon 2
- 15. Pentagon 4 to Pentagon 6





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

 $\{(7, -4) (0, 6) (-2, 3)\}$

16. Reflect over the $y - axis$	18. Rotate 90° <i>counter — clockwise</i>
17. Reflect over the line $y = -x$	19. Dilate by a scale factor r = ½

- Answer each of the following.
- 20. If translation $(5, -3) \rightarrow (-4, 0)$, then $(8, 2) \rightarrow (___, __]$
- 21. If $T: (x, y) \rightarrow (x 5, y + 2)$ and the point F' (7, -6), then find the point F.
- 22. *M* is reflected over the y axis. If *M* is (6, -1), find *M*'.
- 23. C is rotated about the origin 90°. If C' is (-9, 5), find C.
- 24. *Y* is rotated *counterclockwise* 180°. If the image of *Y*' is (0, -3) find *Y*.
- 25. A figure is reflected over the line y = x. If the preimage is (2, 7), find the image.
- 26. $\triangle ABC$ 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'(_____, _____)
- B'(_____, _____)
- C'(_____, _____)



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

Explain why the two triangles are similar.

28. *ABCD* is dilated by a scale factor of r = 2 to produce A'B'C'D'. The lengths of the segments of the preimage are as follows:

AB = 6 BC = 5 CD = 3 AD = 4

- a. What is the length of $\overline{B'C'}$?
- b. What is the length of $\overline{A'B'}$?
- c. If the slope of \overline{CD} is $\frac{1}{3}$, what is the slope of $\overline{C'D'}$? What allows you to make this conclusion?



- 29. *PQRST* ~ *UWXYZ* with a scale factor of 2: 5. If the perimeter of *UWXYZ* is 40 inches, what is the perimeter of *PQRST*?
- 30. 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.
 - a. Translate a triangle 5 units left and 3 units up, and then reflect the triangle over the x axis.
 - b. Translate a triangle 2 *units right* and 7 *units down*, and then rotate 90° *clockwise*.
 - c. Rotate a triangle 90 *degrees counterclockwise*, and then reflect in the line y = x.
 - d. Reflect in the line y = -x, and then translate *right* 4 *units* and *down* 2 *units*.
- 31. An equilateral triangle with sides of length 12 *cm* is reflected consecutively across two lines that are parallel and 12 *cm* apart. Describe the result using another type of transformation.

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

Fill in the correct letter after the given transformation:	A F
a. Rotate 60° <i>clockwise</i> : $E \rightarrow ___$	B E
b. Rotate 60° counter – clockwise: $D \rightarrow ____$	C D
c. Rotate 120° $clockwise: F \rightarrow __\$	
d. Rotate 60° <i>clockwise</i> : $\rightarrow B$	
e. If a translation maps A to B, then it also maps O to and E to	·
f. A reflection occurs over \overleftarrow{FC} , <i>B</i> maps to and <i>F</i> maps to	

Solve:

33.	$\frac{2}{x} = \frac{4}{x+3}$	34. $2x + 6 = 4(x + 8)$	35. $2x + 3y = 6$ $y = \frac{-1}{3}x + 3$
36.	2x + 3y = 7 $3x - 3y = -12$	37. 3x + 5y = 6 $2x - 4y = -7$	38. $6x - 8y = 50$ 4x + 6y = 22

- 39. Given a line segment with endpoints (1, -2) and (4, 5)
 - A) State the **domain and range** of the pre image segment. D: _[____] R: _[____]
 - B) State the domain and range of the image **interval notation** when the relation is:

a)	Translated right 1 and up 4:	d) Reflected in the line $y = x$:
	D:	D:
	R:	R:
b)	Reflected in the $x - axis$:	e) Rotated 90°:
	D:	D:
	R:	R:
c)	Reflected in the $y - axis$:	f) Dilated by a factor of 5 with a center of $(0, 0)$:
	D:	D:
	R:	R: