Math 2 – Honors
Unit 1 – Geometric Transformations
Unit Review

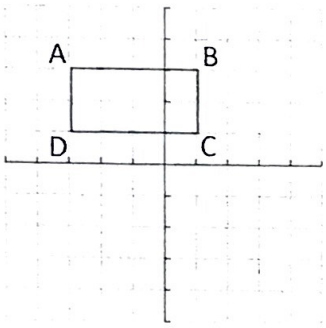
Name_____
Date_____ Pd_____

- 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 $90°$ $clockwise$ about the origin			
6. Rotate $90°$ $counterclockwise$ 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.
- Then write using the correct notation.

8. Reflect over the line $y = -1$



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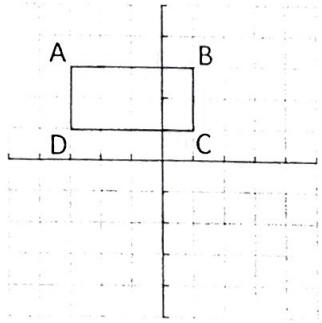
9. Rotate 180° about the origin



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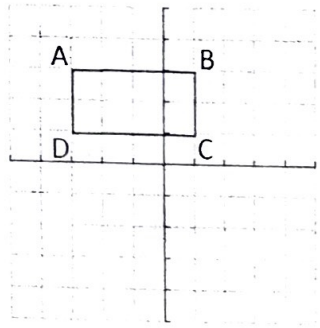
10. Translate right 4 units & down 3 units



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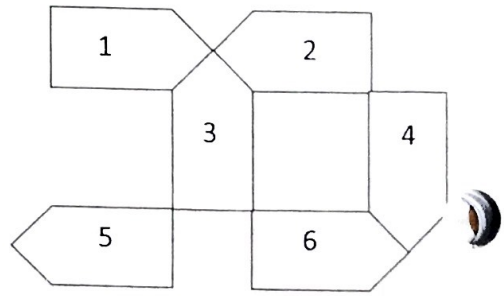
- State whether the specified pentagon is mapped to the other pentagon by a reflection, translation, or rotation

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° $counter-clockwise$
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. ΔABC has vertices $A(5,-2)$, $B(-4,0)$, $C(7,1)$.

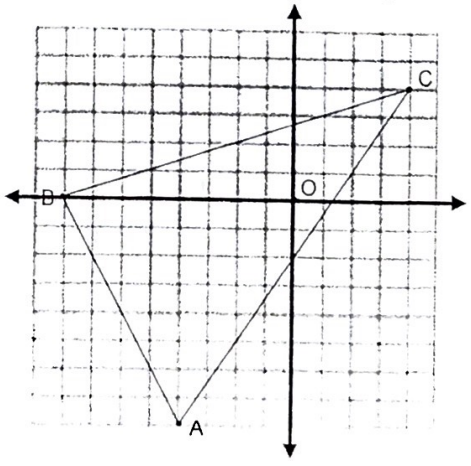
Find the coordinates of the image of the triangle if it is dilated by a scale factor r = 3.

A'(_____, _____)

B'(_____, _____)

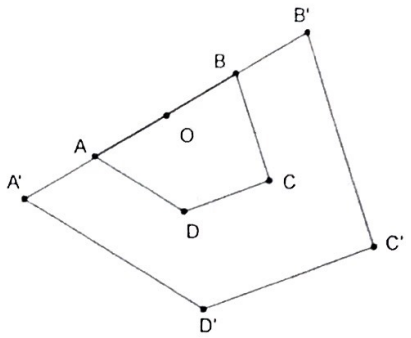
C'(_____, _____)

27. Dilate ΔABC 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:
$AB = 6 \quad BC = 5 \quad CD = 3 \quad AD = 4$



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. $PQRST \sim UWXYZ$ 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 $x - axis$.

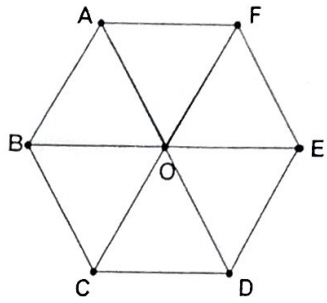
b. Translate a triangle 2 $units\ right$ and 7 $units\ down$, and then rotate 90° $clockwise$.

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. Rotate 60° *clockwise*: $E \rightarrow$ _____

b. Rotate 60° *counter − clockwise*: $D \rightarrow$ _____

c. Rotate 120° *clockwise*: $F \rightarrow$ _____

d. Rotate 60° *clockwise*: _____ $\rightarrow B$

e. If a **translation** maps A to B, then it also maps O to _____ and E to _____.

f. A reflection occurs over $\overleftrightarrow{FC}$, B maps to _____ and F maps to _____.

Solve:

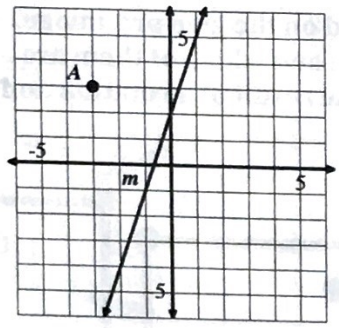
33. $\frac{2}{x} = \frac{4}{x+3}$	34. $2x + 6 = 4(x + 8)$	35. $2x + 3y = 6$ $y = \frac{-1}{3}x + 3$
36. $2x + 3y = 7$ $3x - 3y = -12$	37. $3x + 5y = 6$ $2x - 4y = -7$	38. $6x - 8y = 50$ $4x + 6y = 22$

SET

Topic: Reflecting and rotating points.

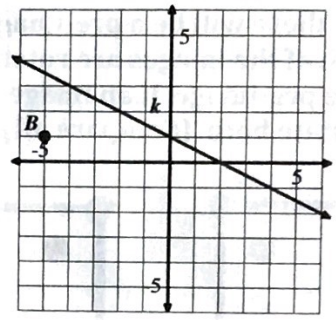
On each of the coordinate grids there is a labeled point and line. Use the line as a line of reflection to reflect the given point and create its reflected image over the line of reflection. (Hint: points reflect along paths perpendicular to the line of reflection. Use perpendicular slope!)

3.



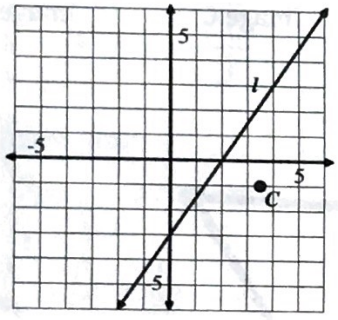
Reflect point ***A*** over line ***m*** and label the image ***A'***

4.



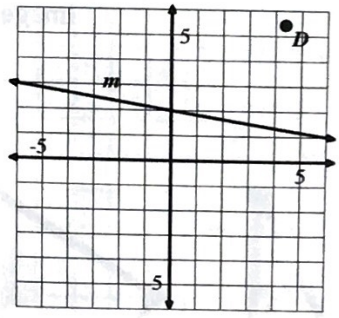
Reflect point ***B*** over line ***k*** and label the image ***B'***

5.



Reflect point ***C*** over line ***l*** and label the image ***C'***

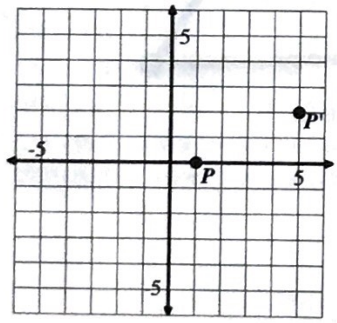
6.



Reflect point ***D*** over line ***m*** and label the image ***D'***

For each pair of point, *P* and *P'* draw in the line of reflection that would need to be used to reflect *P* onto *P'*. Then find the equation of the line of reflection.

7.



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