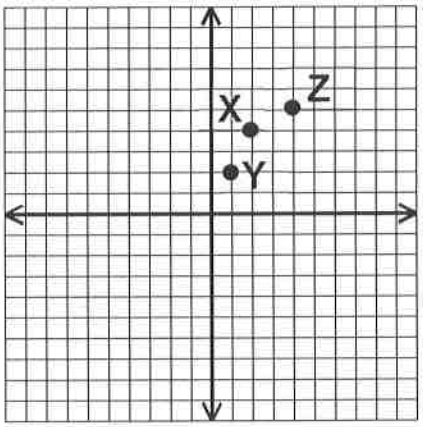
NAME Key DATE _____ PER. ____

REVIEW #20: TRANSFORMATIONS

PART 1: TRANSLATIONS – Use the graph below to translate each point as indicated, then state its new coordinates.

1. X'(8 , 4)	What is the image of X under the translation that shifts (x, y) to (x + 6, y)?
2. Y'(1 , 0)	What is the image of Y under the translation that shifts (x, y) to (x, y - 2)?
3. Z'(-1 , 0)	What is the image of Z under the translation that shifts (x, y) to (x - 5, y - 5)?

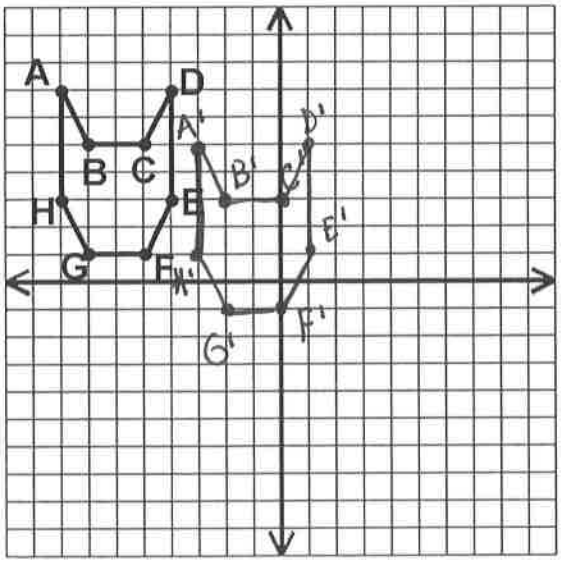


X(2,4) Y(1,2) Z(4,5)

Answer each problem as indicated.

4. A'(-3 , 5)
B'(-2 , 3)
C'(0 , 3)
D'(1 , 5)
E'(1 , 1)
F'(0 , -1)
G'(-2 , -1)
H'(-3 , 1)

Translate (x, y) to (x + 5, y – 2).



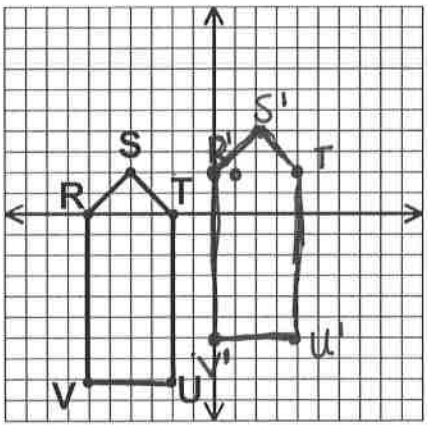
A(-8,7)
B(-7,5)
C(-5,5)
D(-4,7)
E(-4,3)
F(-5,1)
G(-7,1)
H(-8,3)

5. (x+2, y-5)

If the figure in problem 4 above is translated so that H maps onto its image H'(-6, -2), what is the image of any point in the figure under the translation? Write the answer as an ordered pair translation.

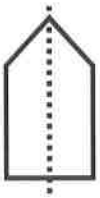
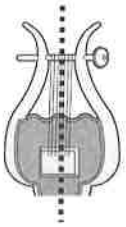
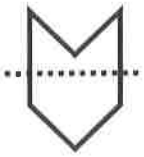
H(-8,3) → H'(-6,-2)

(x, y) → (x+2, y-5)

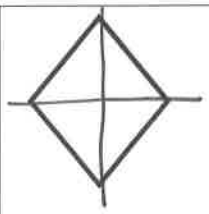
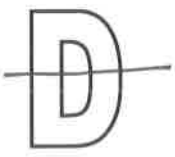
6. R' (0 , 2) S' (2 , 4) T' (4 , 2) U' (4 , -6) V' (0 , -6)	Translate 2 units up and 6 units right. 
7. $\overline{TU}$: $x = -2$ $\overline{V'U'}$: $y = -6$ Lines are: perpendicular	Using the figure(s) in problem 6 above, find the equations of the lines containing $\overline{TU}$ and $\overline{V'U'}$. Tell whether the lines are parallel, perpendicular, or neither.

PART 2: REFLECTIONS

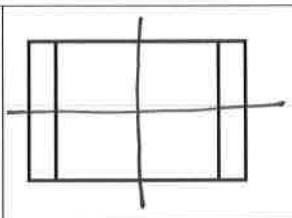
Determine if each dotted line is a line of symmetry. Circle YES or NO.

8.	9.	10.
		
(YES) or NO	YES or (NO)	YES or (NO)

Draw all lines of symmetry, list the total number of lines in the blank provided, & state if the figure would have rotational symmetry.

11. 2		Rotational symmetry: (Yes) or No
12. 1		Rotational symmetry: Yes or (No)

13. 2



Rotational symmetry:

(Yes) or No

14. 3

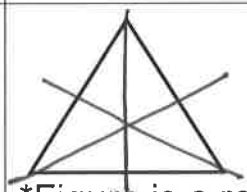


*Figure is a regular polygon.

Rotational symmetry:

(Yes) or No

Answer each problem as indicated.

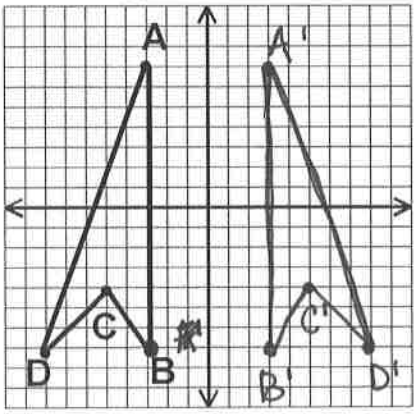
15. Reflect across the y-axis.

A'(3, 7)

B'(3, -7)

C'(5, -4)

D'(8, -7)



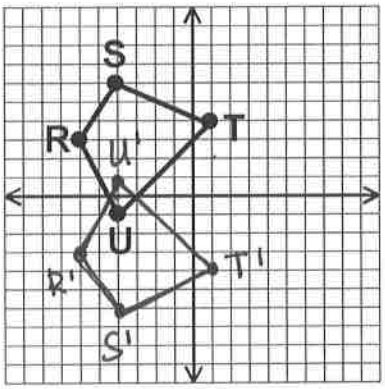
16. Reflect across the x-axis.

R'(-6, -3)

S'(-4, -6)

T'(1, -4)

U'(-4, 1)



17. (-5, 0)

Using the figure in problem 15 above, what would be the coordinate of C if the figure is reflected in the line y = -2?

18. L'(-3, -7)

M'(6, -7)

N'(9, 5)

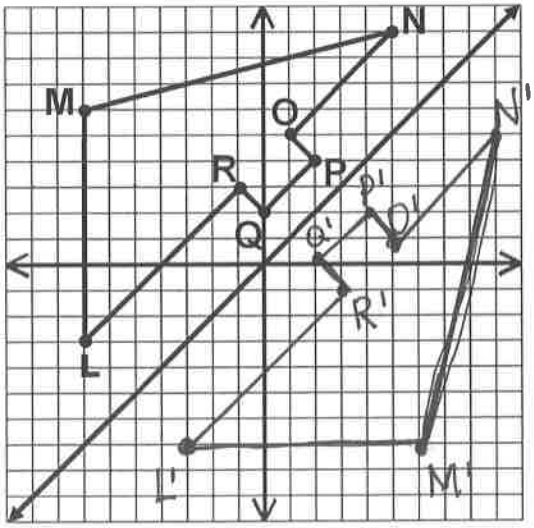
O'(5, 1)

P'(4, 2)

Q'(2, 0)

R'(3, -1)

Reflect across y = x.



L(-7, -3)
M(-7, 6)
N(5, 9)
O(1, 5)
P(2, 4)
Q(0, 2)
R(-1, 3)

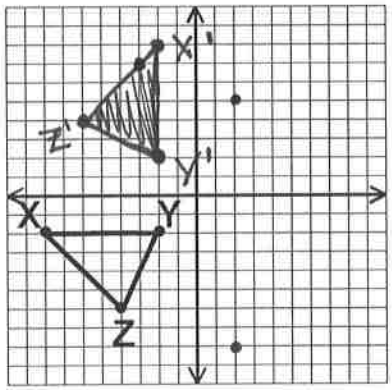
19. (-9, 3)

Using the figure in problem 18 above, what would be the coordinate of R if the figure is reflected in the line x = -5?

PART 3: ROTATIONS – Rotate each polygon as indicated, DRAW the image when appropriate and state the coordinates of the new vertices.

20. X'(-2 , 8)
Y'(-2 , 2)
Z'(-6 , 4)

Rotate 90° clockwise about the origin.



21. (-2, -5)

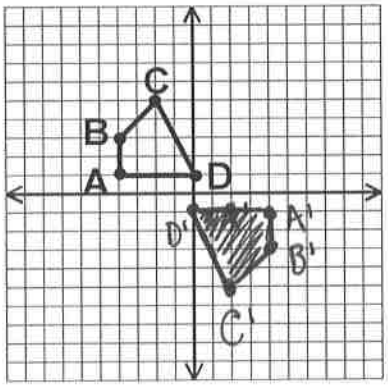
If a point (2, 5) is rotated 180° about the origin, its image will be at what coordinates?

22. (-7, -3)

If a point (-3, 7) is rotated 270° clockwise about the origin, its image will be at what coordinates?

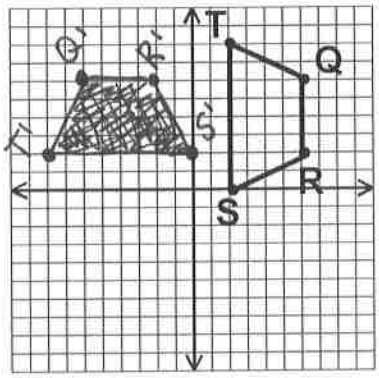
23. Rotate 180°.

A'(4 , -1)
B'(4 , -3)
C'(2 , -5)
D'(0 , -1)



24. Rotate 90° counterclockwise.

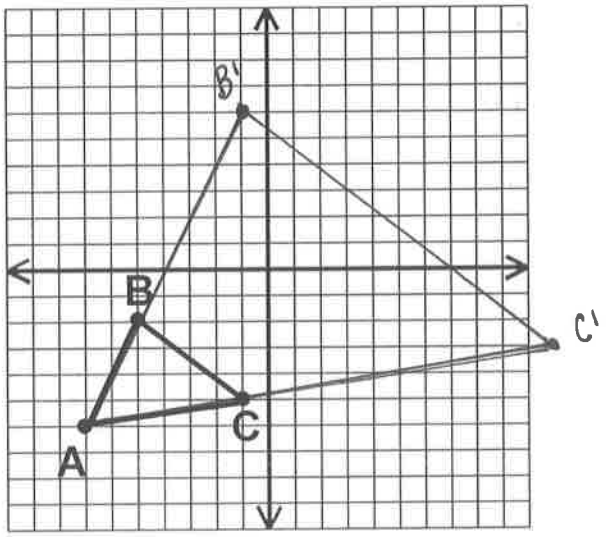
Q'(-6 , 6)
R'(-2 , 6)
S'(0 , 2)
T'(-8 , 2)



PART 4: DILATIONS – Dilate each of the following figures as indicated, DRAW the image and state the coordinates of the new vertices.

25. B'(-1 , 6)
C'(11 , -3)

Scale Factor: 3
Center: A

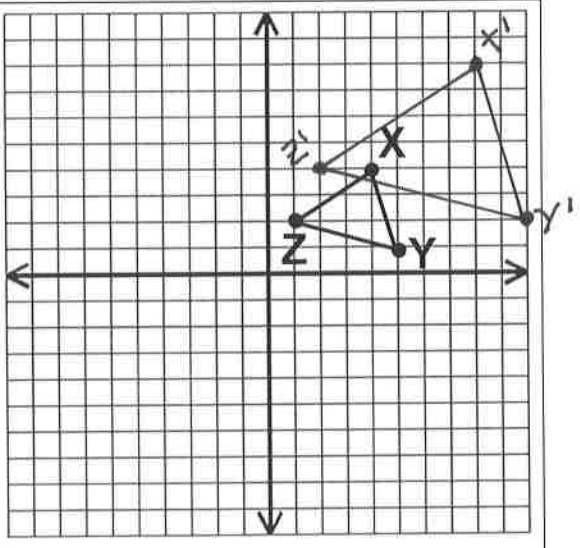


26. A'(7 , 6)

What would be the image of point A after a reflection in the origin? $(-x, -y)$ $A(-7,-6) \rightarrow A'(7,6)$

27. X'(8 , 8)
Y'(10 , 2)
Z'(2 , 4)

Scale Factor: 2
Center: origin

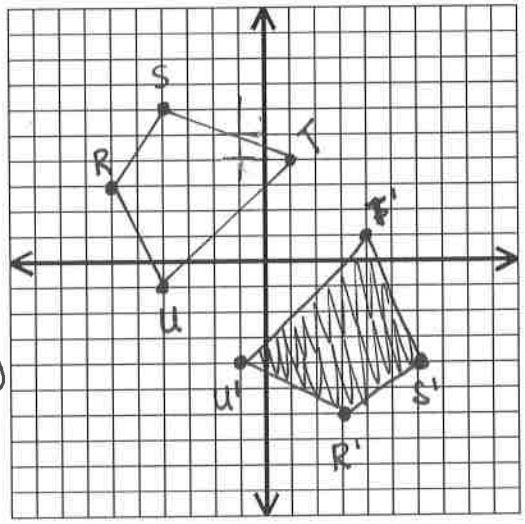


28. R'(3 , -6)
S'(6 , -4)
T'(4 , 1)
U'(-1 , -4)

Quadrilateral RSTU has vertices R(−6, 3), S(−4, 6), T(1, 4), and U(−4, −1). Rotate quadrilateral RSTU 90° clockwise about the origin then reflect it across the x-axis.

90° cw
R' (3,6)
S' (6,4)
T' (4,-1)
U' (-1,4)

Reflect (x,-y)
R' (3,-6)
S' (6,-4)
T' (4,1)
U' (-1,-4)



PART 5: TESSELLATIONS

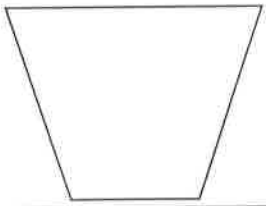
Determine whether each figure can be used as a basic unit for a tessellation.

29. YES or (NO)

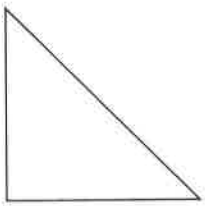
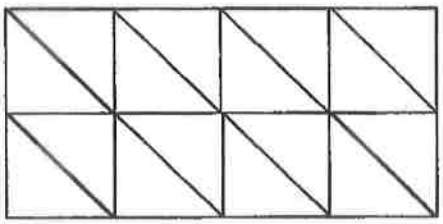
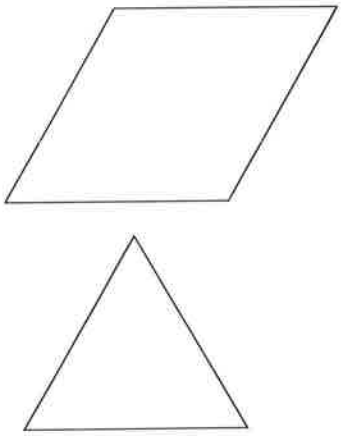
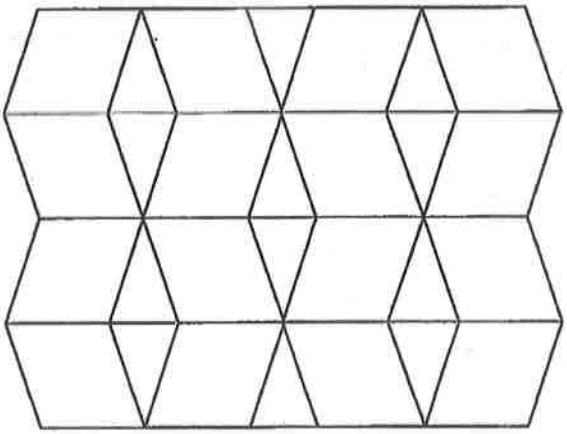
A regular 18-gon

① $\frac{180(16)}{18} = 160$ ② $\frac{360}{160} = 2.25$

30. (YES) or NO



Use the figure or pair of figures to sketch a tessellation. Determine if each figure given has rotational symmetry .

31. 	
32. 	

Answer the following questions.

33. B	Point *A* is located at (4, -7). The point is reflected in the x-axis. Where is the image of *A* located? $(x, -y) \rightarrow (4, 7)$ A. (-4, -7) (B.) (4, 7) C. (7, -4) D. (-4, 7)
34. D	What are the coordinates of point *P*, the image of point (3, -4) after a reflection in the line y = x? $(y, x) \rightarrow (-4, 3)$ A. (3, 4) B. (-3, 4) C. (4, -3) (D.) (-4, 3)
35. C	What are the coordinates of the image of point (-2, 6) after a reflection in the y-axis? $(-x, y) \rightarrow (2, 6)$ A. (2, -6) B. (6, -2) (C.) (2, 6) D. (-2, -6)
36. B	What is the image of point (-3, 2) after a reflection in the origin? $(-x, -y)$ $(3, -2)$ A. (-2, -3) (B) (3, -2) C. (-3, -2) D. (-2, 3)

37. C	The image of point (-2, 3) under translation T is (3, -1). What is the image of point (4, 2) under the same translation? A. (5, 4) B. (0, 7) C. (9, -2) D. (-1, 6)
38. B	What is the image of point (3, -5) under the translation that shifts (x, y) to (x – 1, y – 3)? $(3-1, -5-3) = (2, -8)$ A. (-3, 15) B. (2, -8) C. (2, 8) D. (-4, 8)
39. C	Point P'(-6, -4) is the image of point P(-2, 3) under translation T. What is the image of (5, -1) under the same translation? A. (-1, -5) B. (9, 6) C. (1, -8) D. (3, 2)

#37) $(-2,3) \rightarrow (3,-1)$

$(x,y) \rightarrow (x+5, y-4)$

$(4,2) \rightarrow (4+5, 2-4) = (9,-2)$

#39) $(-2,3) \rightarrow (-6,-4)$

$(x,y) \rightarrow (x-4, y-7)$

$(5,-1) \rightarrow (5-4, -1-7) = (1,-8)$