Crazy Cartoons Test
Module Assessment (Version 2)

Name_____

For each question:

5 points for explaination/work
3 points for the correct answer.

1. Evaluate.
$$\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix}\begin{bmatrix} -2 & 1 & 0 \\ 0 & -5 & 3 \end{bmatrix}$$

[1] _____

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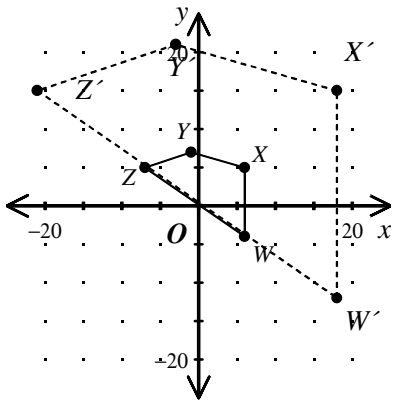
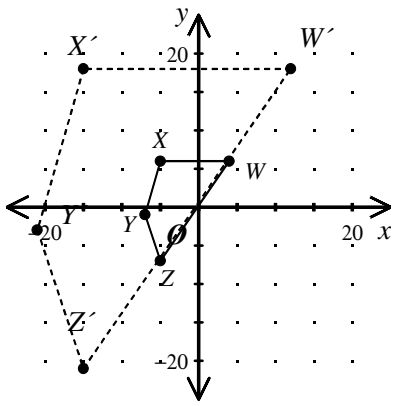
2. (Multiple Choice): Find the graph that shows the quadrilateral *WXYZ* with a vertex matrix of $\begin{bmatrix} -4 & 5 & 7 & 5 \\ 6 & 6 & -1 & -7 \end{bmatrix}$ and its image after a stretch by a scale factor of 3.

   Non-Multiple choice)Write the associated matrix equation

[A]

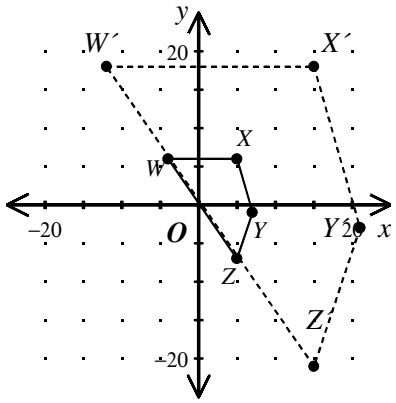


[B]

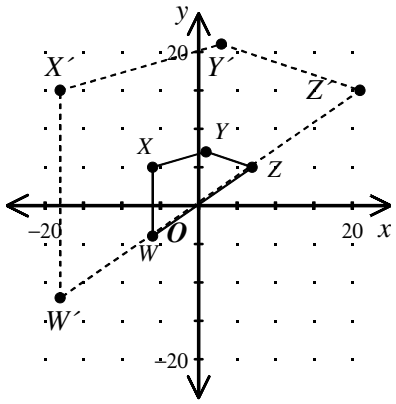

y
X´
W´
20
X
W
Y
Y
O
20
x
Z
Z´
–20

[2] _____

[C]

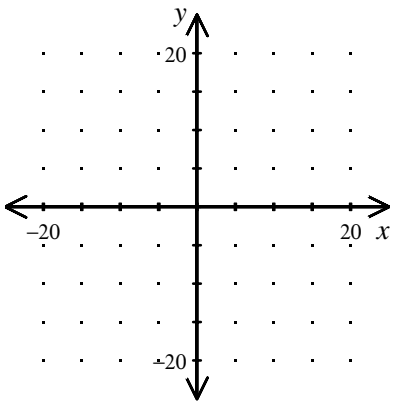

y
W´
X´
20
X
W
–20
O
Y
Y´
20
x
Z
Z´
–20

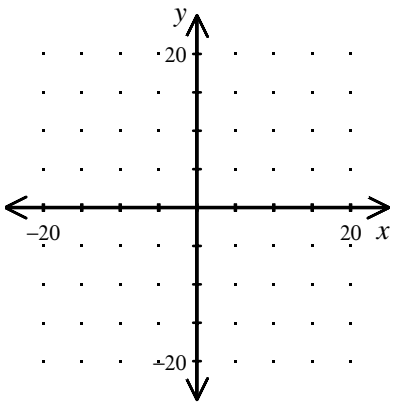
[D]


y
20
X´
Y´
Z´
Y
X
Z
–20
O
20
x
W
W´
–20

3. Triangle *DEF* has a vertex matrix of $\begin{bmatrix} -2 & 7 & 5 \\ 6 & 2 & -1 \end{bmatrix}$.

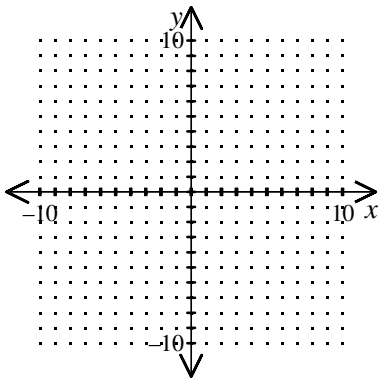
Graph triangle *DEF*.
Then graph its image after a translation right 4 units and up 9 units.
Write the associated matix equation
Find the length of the translation vector

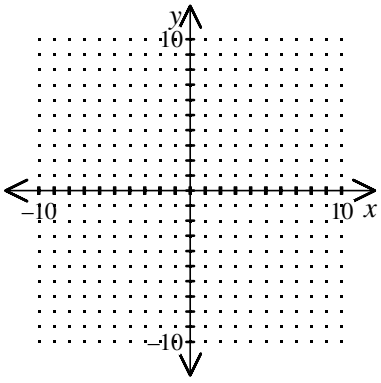




[3]

4. Graph the triangle represented by the matrix $\begin{bmatrix} 0 & 3 & 2 \\ 0 & -1 & -3 \end{bmatrix}$. Multiply the matrix by $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$. Graph the resulting triangle. How does the second triangle relate to the first?

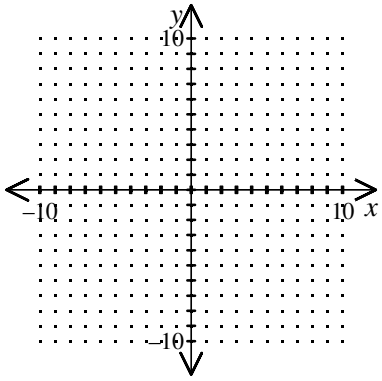


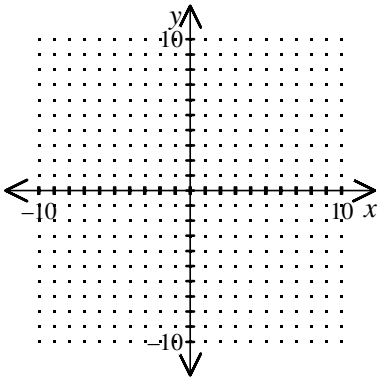


[4] _____

5. The matrix $\begin{bmatrix} -1 & -1 & 1 & 1 \\ 7 & 0 & 0 & 4 \end{bmatrix}$ represents a quadrilateral. Use the matrix $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ to rotate the quadrilateral.

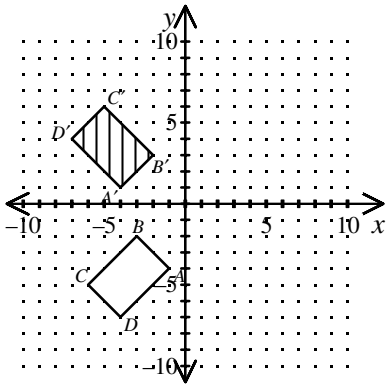
Graph both the original quadrilateral and its image.
Write the associated matrix equation.
Identify the angle of rotation.





[5] _____

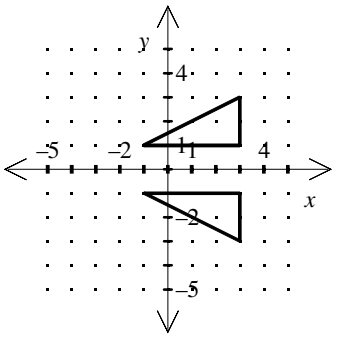
6. How is figure $A'B'C'D'$ related to figure $ABCD$? Be as specific as possible.



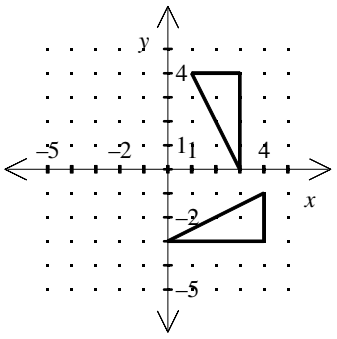
[6] _____

7. Which of the following shows a triangle and its rotation image about the origin?

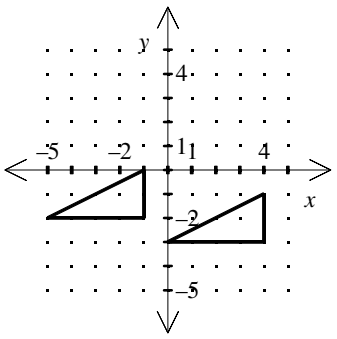
[A]



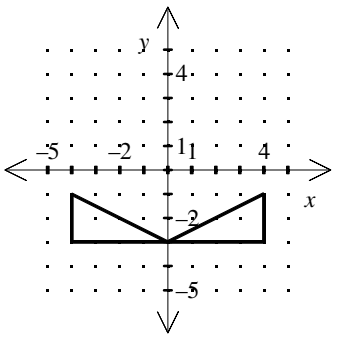
[B]



[C]



[D]



[7] _____

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8. The coordinates of the vertices of ΔXYZ are $X(3, 5)$, $Y(1, 3)$, and $Z(3, 2)$. ΔXYZ is reflected over the y-axis. Find the coordinates of the vertices of its image $\Delta X'Y'Z'$.

[8] _____

9. Matrix **M** below represents the vertices of a triangle.

$$\mathbf{M} = \begin{bmatrix} -2 & 1 & 0 \\ 0 & -5 & 3 \end{bmatrix}$$

In Parts a–f, perform the indicated operation and describe the transformation that results.

a. $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \bullet \mathbf{M}$ **b.** $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix} \bullet \mathbf{M}$ **c.** $\begin{bmatrix} -3 & -3 & -3 \\ 2 & 2 & 2 \end{bmatrix} + \mathbf{M}$

d. $\begin{bmatrix} 5 & 0 \\ 0 & 5 \end{bmatrix} \bullet \mathbf{M}$ **e.** $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix} \bullet \mathbf{M}$ **f.** $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix} \bullet \mathbf{M}$

Resulting coordinates	Description of Transformation

[9] _____

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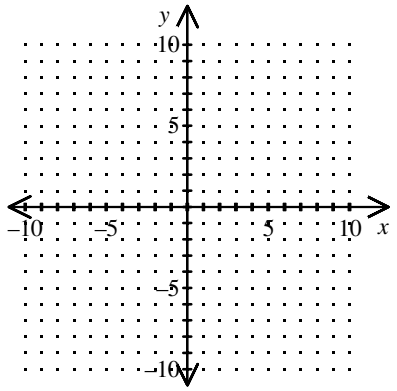
10. Find the coordinates of the image of a triangle with vertices $A(0, -6)$, $B(9, 0)$, and $C(-2, 9)$ under a rotation of $90°$ counterclockwise about the origin.

[10] _____

11. Graph the triangle with vertices $M(-7,\ 2)$, $N(-3,\ 2)$, and $P(-5,\ 5)$. Then draw its reflection over the *y*-axis.



[11] _____

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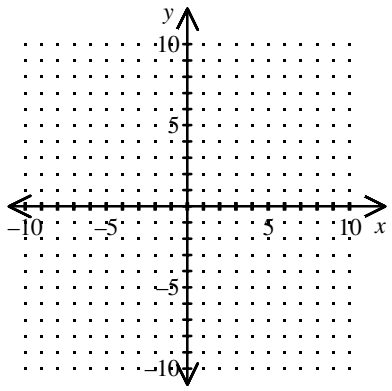
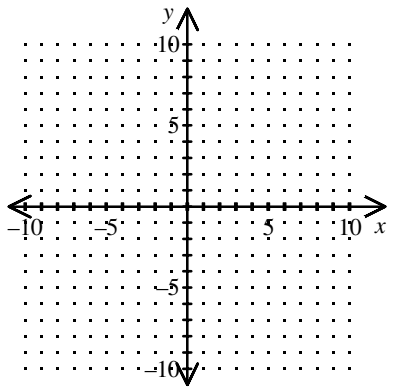
12. Graph figure *ABCD* with vertices $A(-3,\ 4)$, $B(-6,\ 7)$, $C(-8,\ 5)$, and $D(-5,\ 2)$. Draw the image of *ABCD* after a rotation of 180° about the origin.



[12] _____

13. Graph figure *ABCD* with vertices $A(3,\ 4),\ B(2,\ 5),\ C(1,\ 4),$ and $D(2,\ 3)$. Draw the image of *ABCD* after a rotation of 90° counterclockwise about the origin.

Write the associated matrix equation



[13] _____

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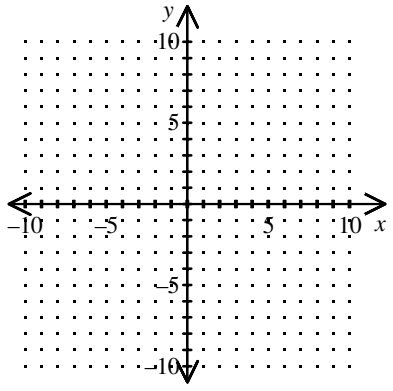
14. Graph figure *ABCD* with vertices $A(-3,\ -2),\ B(-6,\ 1),\ C(-10,\ -3),$ and $D(-7,\ -6)$.

Draw the image of *ABCD* after a rotation of 90° clockwise about the origin.

Write the associated matrix equation



[14] _____

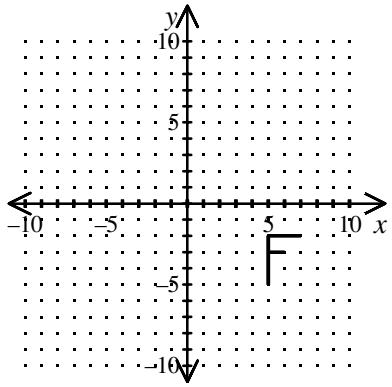
15. Write the translation matrix that can replace the composition of these three translations:

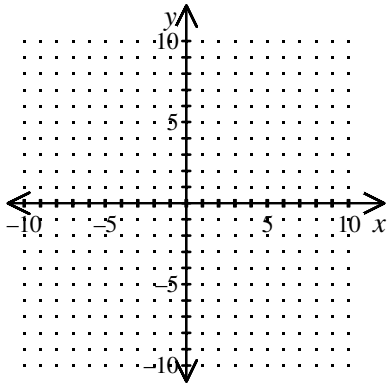
    First translation 4 to the right and 15 down.
    Second translation: 5 to the left and 7 up.
    Third translation: 14 to the right and 1 up.

    Part 2: Find the length of the resulting translation vector

[15] _____

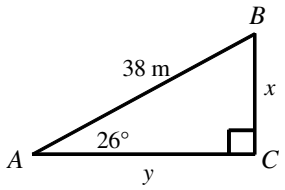
16. Reflect the figure over the line $y = x$ then over the y-axis. Describe the resulting rotation both in words and using a matrix equation.





[16] _____

17. Find the perimeter of ΔABC. (Round to the nearest decimal place.)



[17] _____