Name_____ Due Date _____Period_____

15.4 Matrix Review and Matrix Transformations

Give the dimensions of each matrix. (rowXcolumn)

| | | |
|---|---|---|
| 1. $\begin{bmatrix}1 & 2 & 3\\4 & 5 & 6\end{bmatrix}$ | 2. $\begin{bmatrix}0 & 4 & 8\\1 & 5 & 9\\2 & 6 & 0\\3 & 7 & 1\end{bmatrix}$ | 3. $\begin{bmatrix}5 & -5\\2 & 3\\9 & 8\end{bmatrix}$ |
| 4. $\begin{bmatrix}4 & -1\\0 & 2\end{bmatrix}$ | 5. $\begin{bmatrix}4 & 1 & -2\\3 & -1 & 1\end{bmatrix}$ | 6. $\begin{bmatrix}5\\8\\2\end{bmatrix}$ |

7. If AB can be multiplied but BA CAN'T be multiplied, then → The _____ of the first matrix and the _____of the second matrix must be the same.

$A = \begin{bmatrix}3 & 5\end{bmatrix}$ $B = \begin{bmatrix}4 & 1 & -2\\3 & -1 & 1\end{bmatrix}$

| | | |
|---|---|---|
| 8. In the expression $A \cdot B$, if A is a $3 \times 5$ matrix then what could be the dimensions of B? | 9. In the expression $A \cdot B$, if A is a $1 \times 8$ matrix then what could be the dimensions of B? | 10. In the expression $A \cdot B$, if B is a $2 \times 4$ matrix then what could be the dimensions of A? |

11. Matrix Multiplication: Multiply _____ of the first matrix by _____ of the second matrix. Multiply corresponding part and then find the sum.

$$\begin{bmatrix}1 & 2 & 3\\4 & 5 & 6\end{bmatrix} \times \begin{bmatrix}7 & 8\\9 & 10\\11 & 12\end{bmatrix} = \begin{bmatrix}58 & 64\\139 & 154\end{bmatrix}$$

Find the product.

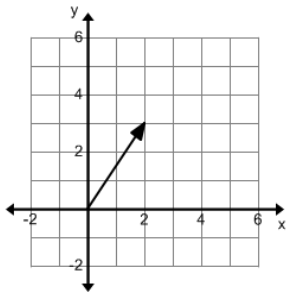
| | | |
|---|---|---|
| 12. $\begin{bmatrix}-5\\6\\0\end{bmatrix} \cdot \begin{bmatrix}3 & -1\end{bmatrix}$ | 13. $\begin{bmatrix}-5 & -5\\-1 & 2\end{bmatrix} \cdot \begin{bmatrix}-2 & -3\\3 & 5\end{bmatrix}$ | 14. $\begin{bmatrix}2\\6\end{bmatrix} \cdot \begin{bmatrix}-2 & 3\\4 & 7\end{bmatrix}$ |

15. You start up a baking business and sell cupcakes for \$3, pies for \$4, and cookies for \$2. You use a matrix to keep track of how much you sell in a week. The first column is Monday and goes through Thursday. How much money did you make?

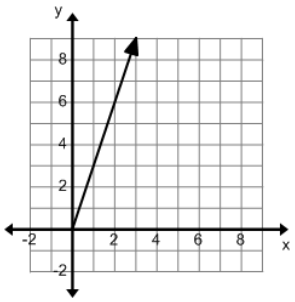
$$\begin{bmatrix}\$3 & \$4 & \$2\end{bmatrix} \cdot \begin{bmatrix}13 & 9 & 7 & 15\\8 & 7 & 4 & 6\\6 & 4 & 0 & 3\end{bmatrix}$$

Find the new vector by dilating the original. **Graph** the transformed vector.

1. Dilate $v = \langle 2,3 \rangle$ by a factor of 2

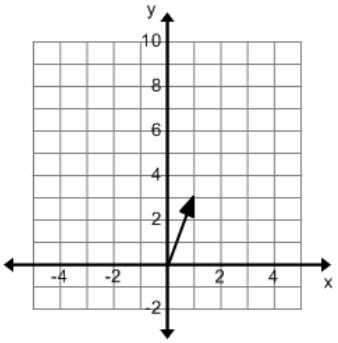



2. Dilate $w = \langle 3,9 \rangle$ by a factor of $\frac{1}{3}$



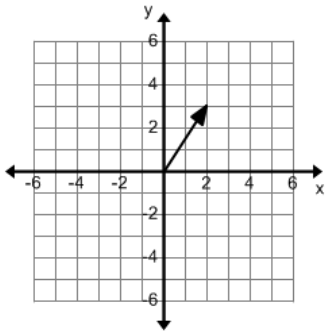

Find the new vector by rotating the original. **Graph** the transformed vector, the **describe** the results.

3. Rotate $v = \langle 1,3 \rangle$ using $\begin{bmatrix} -3 & 0 \\ 0 & 3 \end{bmatrix}$




Description:

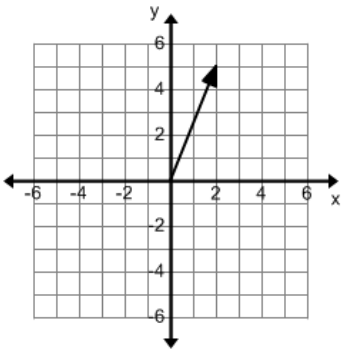
4. Rotate $t = \langle 2,3 \rangle$ using $\begin{bmatrix} 2 & 0 \\ 0 & -2 \end{bmatrix}$



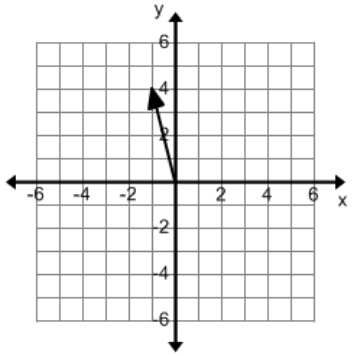

Description:

Find the new vector by reflecting the original.

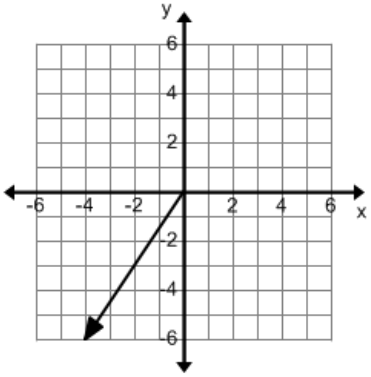
5. Reflect $v = \langle 2,5 \rangle$ across the origin




6. Reflect $w = \langle -1,4 \rangle$ across the x axis




7. Reflect $t = \langle -4, -6 \rangle$ across the y axis




8. REVIEW:
   What is the component form for the vector with initial point (3,7) and terminal point (-4,3)? What does this tell you about the vector?