

4.11 The Inverse and Determinant of a Matrix

AP Precalculus

Name: _____

CA #2

Directions: Find the determinant of each matrix. Tell whether or not the matrix will have an inverse.

1) $\begin{bmatrix} 3 & 10 \\ -4 & 5 \end{bmatrix}$

2) $\begin{bmatrix} -\frac{1}{3} & -15 \\ \frac{4}{5} & 18 \end{bmatrix}$

Directions: Find the inverse of each matrix if possible.

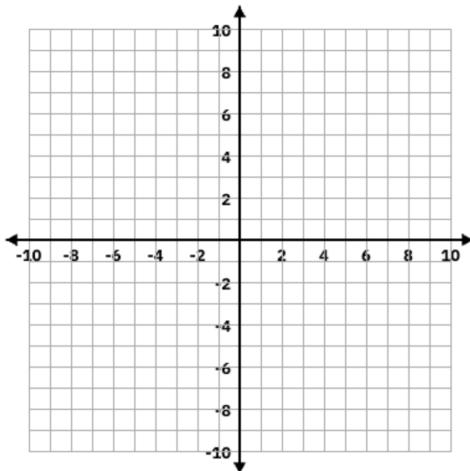
4) $\begin{bmatrix} 3 & 5 \\ -2 & 0 \end{bmatrix}$

5) $\begin{bmatrix} -8 & -6 \\ 5 & 4 \end{bmatrix}$

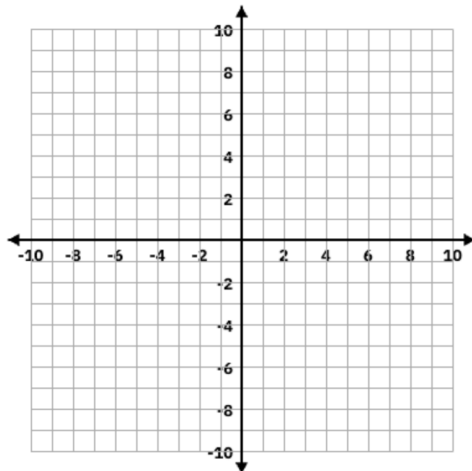
6) $\begin{bmatrix} 8 & 4 \\ -6 & -3 \end{bmatrix}$

Directions: Plot the parallelogram formed by the vectors and then find the area.

10) $\langle 6, -4 \rangle$ and $\langle -4, -2 \rangle$



11) $\langle 2, -7 \rangle$ and $\langle 5, 5 \rangle$



ANSWERS

Directions: Find the determinant of each matrix. Tell whether or not the matrix will have an inverse.

$$1) \begin{bmatrix} 3 & 10 \\ -4 & 5 \end{bmatrix}$$

$$= 15 - -40$$

$$= 55$$

$$2) \begin{bmatrix} -\frac{1}{3} & -15 \\ \frac{4}{5} & 18 \end{bmatrix}$$

$$= -6 + +12$$

$$= 6$$

Directions: Find the inverse of each matrix if possible.

$$4) \begin{bmatrix} 3 & 5 \\ -2 & 0 \end{bmatrix} \quad 3 - -10 = 13$$

$$\frac{1}{13} \begin{bmatrix} -3 & -5 \\ +2 & 0 \end{bmatrix} = \begin{bmatrix} -\frac{3}{13} & -\frac{5}{13} \\ \frac{2}{13} & 0 \end{bmatrix}$$

$$5) \begin{bmatrix} -8 & -6 \\ 5 & 4 \end{bmatrix} \quad -32 + +30$$

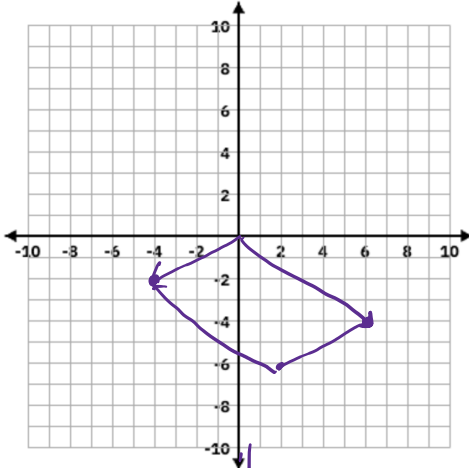
$$\frac{1}{-2} \begin{bmatrix} 4 & 6 \\ -5 & -8 \end{bmatrix} = \begin{bmatrix} -2 & -3 \\ \frac{5}{2} & 4 \end{bmatrix}$$

$$6) \begin{bmatrix} 8 & 4 \\ -6 & -3 \end{bmatrix} \quad -24 - -24 = 0$$

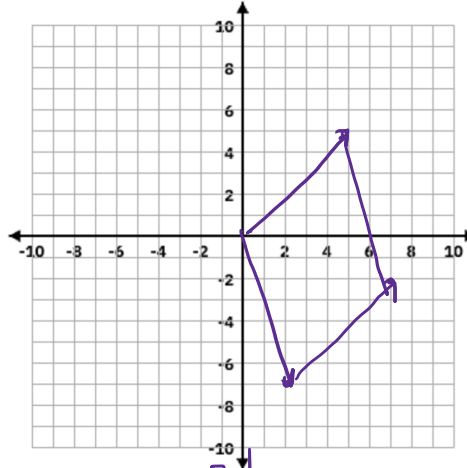
NO INVERSE

Directions: Plot the parallelogram formed by the vectors and then find the area.

10) $\langle 6, -4 \rangle$ and $\langle -4, -2 \rangle$



11) $\langle 2, -7 \rangle$ and $\langle 5, 5 \rangle$



$$\left| \det \begin{bmatrix} 6 & -4 \\ -4 & -2 \end{bmatrix} \right| = |12 - 16|$$

$$= |-28|$$

$$= 28 \text{ u}^2$$

$$\left| \det \begin{bmatrix} 2 & 5 \\ -7 & 5 \end{bmatrix} \right| = |10 - -35|$$

$$= |45|$$

$$= 45 \text{ u}^2$$