

Precalculus Honors
7.2 - 7.3 Review

Name KEY
Period _____

For each of the following problems, perform the indicated operation if it is possible. If not possible, write "NP".

1. $\begin{bmatrix} 2 \\ 5 \\ -3 \end{bmatrix} + [0 \ 1 \ 4] = \text{NP}$

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

3. $2 \begin{bmatrix} 3 & -4 \\ 7 & 5 \end{bmatrix} = \begin{bmatrix} 6 & -8 \\ 14 & 10 \end{bmatrix}$

4. $\begin{bmatrix} 5 \\ 3 \end{bmatrix} \cdot [2 \ 4] = \begin{bmatrix} 10 & 20 \\ 6 & 12 \end{bmatrix}$

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

a) What is the order of M?

3×4

b) Give the value of m_{23}

-2

6. Solve for a and b: $\begin{bmatrix} a & -4 \\ 7 & 5 \end{bmatrix} \cdot \begin{bmatrix} 3 & 4 \\ b & 5 \end{bmatrix} = \begin{bmatrix} 2 & 3b-8 \\ 11b-3 & 53 \end{bmatrix}$

$a = 6$
 $b = 4$

$\begin{bmatrix} 3a - 4b & 4a - 20 \\ 21 + 5b & 53 \end{bmatrix} = \begin{bmatrix} 2 & 3b - 8 \\ 11b - 3 & 53 \end{bmatrix}$

$21 + 5b = 11b - 3 \rightarrow 6b = 24 \rightarrow b = 4$

$4a - 20 = 3b - 8 \rightarrow 4a - 20 = 4 \rightarrow 4a = 24 \rightarrow a = 6$

7. Consider the matrices $A = \begin{bmatrix} 1 & -2 \\ 3 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 2 \\ 1 & 0 \end{bmatrix}$ Find:

a) $A \cdot B$ $\begin{bmatrix} 2 & 2 \\ 14 & 6 \end{bmatrix}$

b) $B \cdot A$ $\begin{bmatrix} 10 & -4 \\ 1 & -2 \end{bmatrix}$

c) $5B - 3A$ $\begin{bmatrix} 17 & 16 \\ -4 & -6 \end{bmatrix}$

d) A^{-1} $\begin{bmatrix} 1/4 & 4 \\ -3/8 & 1/8 \end{bmatrix}$

e) B^{-1} $\begin{bmatrix} 0 & 1 \\ 1/2 & -2 \end{bmatrix}$

8. (Calculator okay) For each system of equations below, rewrite the system as a matrix equation and solve using a matrix inverse (label your matrices and show the expression you evaluated to solve)

$$3x - y + 4z = 23$$

a) $x + 4y + 2z = 8$

$$4x - 2y - z = -13$$

$$-x + 2y + 7z = 8$$

b) $5x + 4y - 3z = 10$

$$-3x + 8y + 5z = -10$$

$$\begin{bmatrix} 3 & -1 & 4 \\ 1 & 4 & 2 \\ 4 & -2 & -1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 23 \\ 8 \\ -13 \end{bmatrix}$$

$$X = A^{-1}B \quad \begin{matrix} x = \\ y = \\ z = \end{matrix}$$

$$\begin{bmatrix} -1 & 2 & 7 \\ 5 & 4 & -3 \\ -3 & 8 & 5 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 8 \\ 10 \\ -10 \end{bmatrix}$$

$$X = A^{-1}B \Rightarrow \begin{bmatrix} x = 4 \\ y = -1 \\ z = 2 \end{bmatrix}$$