

Name _____

1) Find the product below.

$$\begin{bmatrix} 1 & 3 \\ 5 & -2 \end{bmatrix} \begin{bmatrix} 2 & 4 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 3 \\ 5 & -2 \end{bmatrix} \begin{bmatrix} 2 & 4 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 2+0 & 4+3 \\ 10+0 & 20-2 \end{bmatrix} = \begin{bmatrix} 2 & 7 \\ 10 & 18 \end{bmatrix}$$

2) Find the sum below.

$$\begin{bmatrix} 1 & 3 \\ 5 & -2 \end{bmatrix} + \begin{bmatrix} 2 & 4 \\ 0 & 1 \end{bmatrix}$$

$$\begin{bmatrix} 1 & 3 \\ 5 & -2 \end{bmatrix} + \begin{bmatrix} 2 & 4 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 3 & 7 \\ 5 & -1 \end{bmatrix}$$

3) Solve the following matrix equation for X .

$$AX + B = C$$

$$AX = C - B$$

$$X = A^{-1}(C - B)$$

***Common mistake: A lot of people received no credit here because they either multiplied on the wrong side, $(C - B)A^{-1}$ or failed to realize which side you multiply on matters, $\frac{C-B}{A}$.

4) Solve the system of equations below.

$$\begin{aligned} x_1 + 4x_2 + x_3 &= 0 \\ x_2 - x_3 &= 0 \end{aligned}$$

x_3 is free.

$$x_2 = x_3$$

$$x_1 = -5x_3$$

Each solution looks like $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} -5x_3 \\ x_3 \\ x_3 \end{bmatrix}$

The solution set is $\left\{ \begin{bmatrix} -5x_3 \\ x_3 \\ x_3 \end{bmatrix} : x_3 \in \mathbb{R} \right\}$

***Common mistake: A lot of people lost one point because they found what the solutions look like, but did not actually give the collection of *all* the solutions. That is, the solution set.