

If you ever see matrices in a college class, I bet you get to use your graphing calculator!! Enter each matrix on your graphing calculator first and then perform the operations using the guidelines on the Keystrokes Handout (see reverse side).

Given the following matrices, simplify the expressions, using fractions instead of decimals.

$$A = \begin{bmatrix} 7 & -2 \\ -1 & 0 \end{bmatrix} \quad B = \begin{bmatrix} 3 & 7 \\ -2 & 4 \end{bmatrix} \quad C = \begin{bmatrix} 1 & -5 \\ -3 & 2 \end{bmatrix} \quad D = \begin{bmatrix} 2 & -3 & 1 \\ 4 & 2 & -1 \\ -2 & 3 & -3 \end{bmatrix}$$

$$E = \begin{bmatrix} 4 & 3 & 1 \\ -2 & -1 & -1 \end{bmatrix} \quad F = \begin{bmatrix} 6 & 5 & -2 \\ 2 & 4 & -1 \\ 3 & 1 & 4 \end{bmatrix}$$

1. $A + 2B - 3C$

$$\begin{bmatrix} 10 & 27 \\ 4 & 2 \end{bmatrix}$$

2. $-2(FD)$

$$\begin{bmatrix} -72 & 28 & -14 \\ -44 & 2 & 2 \\ -4 & -10 & 20 \end{bmatrix}$$

3. A^2

$$\begin{bmatrix} 51 & -14 \\ -7 & 2 \end{bmatrix}$$

4. $\frac{1}{2}(AB) - 2(BC)$

$$\begin{bmatrix} 9\frac{1}{2} & 45\frac{1}{2} \\ 53\frac{1}{2} & -79\frac{1}{2} \end{bmatrix}$$

5. $(A + B)|C|$

$$\begin{bmatrix} -130 & -65 \\ 39 & -52 \end{bmatrix}$$

6. $|C| + |D|$

-45

7. C^{-1}

$$\begin{bmatrix} -2/13 & -5/13 \\ -3/13 & -1/13 \end{bmatrix}$$

8. D^{-1}

$$\begin{bmatrix} 3/32 & 3/16 & -1/32 \\ -7/16 & 1/8 & -3/16 \\ -1/2 & 0 & -1/2 \end{bmatrix}$$

9. $F \cdot F^{-1}$

$$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

10. $3D - F$

$$\begin{bmatrix} 6 & -14 & 5 \\ 10 & 2 & -2 \\ -9 & 8 & -13 \end{bmatrix}$$

Write each system as a matrix equation and then solve.

$X = A^{-1}B$

11. $3x + 2y = -5$
 $4x = 2y + 10 \Rightarrow 4x - 2y = 10$

$$\begin{bmatrix} 3 & 2 \\ 4 & -2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -5 \\ 10 \end{bmatrix}$$

$$x = \frac{5}{7}$$

$$y = -\frac{25}{7}$$

13. $-4 + y + z = x \Rightarrow -x + y + z = 4$
 $-x + 2y - 3z = -6$
 $2x - 4y + 8z = 18$

$$\begin{bmatrix} -1 & 1 & 1 \\ -1 & 2 & -3 \\ 2 & -4 & 8 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 4 \\ -6 \\ 18 \end{bmatrix}$$

$$x = 1$$

$$y = 2$$

$$z = 3$$

12. $6x + 2 = y \Rightarrow 6x - y = -2$
 $-18x + 3y = 4$

$$\begin{bmatrix} 6 & -1 \\ -18 & 3 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -2 \\ 4 \end{bmatrix}$$

14. $5x + 3y + 2z = 1$
 $x - 2y - 2 = -z \Rightarrow x - 2y + z = 2$
 $-5x - 2y + 2z = 11$

$$\begin{bmatrix} 5 & 3 & 2 \\ 1 & -2 & 1 \\ -5 & -2 & 2 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 2 \\ 11 \end{bmatrix}$$

$$x = -1$$

$$y = 0$$

$$z = 3$$

Parallel lines - No Solution