

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.  $A + 2B - 3C$
2.  $-2(FD)$
3.  $A^2$
4.  $\frac{1}{2}(AB) - 2(BC)$
5.  $(A + B)|C|$
6.  $|C| + |D|$
7.  $C^{-1}$
8.  $D^{-1}$
9.  $F \cdot F^{-1}$
10.  $3D - F$

Write each system as a matrix equation and then solve.

$$11. \quad \begin{cases} 3x + 2y = -5 \\ 4x = 2y + 10 \end{cases}$$

$$13. \quad \begin{cases} -4 + y + z = x \\ -x + 2y - 3z = -6 \\ 2x - 4y + 8z = 18 \end{cases}$$

$$12. \quad \begin{cases} 6x + 2 = y \\ -18x + 3y = 4 \end{cases}$$

$$14. \quad \begin{cases} 5x + 3y + 2z = 1 \\ x - 2y - 2 = -z \\ -5x - 2y + 2z = 11 \end{cases}$$