

8.2 — Matrix Operations

Perform the indicated matrix operations given that A , B , C , and D are defined as follows. If an operation is not possible, then so state.

$$A = \begin{bmatrix} 2 & -1 & 2 \\ 5 & 3 & -1 \end{bmatrix}$$

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

$$C = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 1 & 2 \\ -1 & 2 & 1 \end{bmatrix}$$

$$D = \begin{bmatrix} -2 & 3 & 1 \\ 3 & -2 & 4 \end{bmatrix}$$

1. $A + D$

2. $2B$

3. $D - A$

4. $B + C$

5. $-2A + 4D$

6. $-5(D + A)$

7. AB

8. BA

9. BD

10. AC

Use the definition of equal matrices to find the value of the variables.

$$11. \begin{bmatrix} x & 2y \\ z & 9 \end{bmatrix} = \begin{bmatrix} 4 & 12 \\ 3 & 9 \end{bmatrix}$$

$$12. \begin{bmatrix} x & y+3 \\ 2z & 8 \end{bmatrix} = \begin{bmatrix} 12 & 5 \\ 6 & 8 \end{bmatrix}$$

$$13. \begin{bmatrix} x+2 & 8 & -3 \\ 1 & 2y & 2x \\ 7 & -2 & y+2 \end{bmatrix} = \begin{bmatrix} 2x+6 & 8 & -3 \\ 1 & 18 & -8 \\ 7 & -2 & 11 \end{bmatrix}$$

$$14. \begin{bmatrix} 2x & 3 \\ -3 & y-7x \end{bmatrix} = \begin{bmatrix} 3x+2 & 3 \\ -3 & -4x \end{bmatrix}$$

$$15. \begin{bmatrix} z & -3 \\ 3x & 0 \end{bmatrix} + \begin{bmatrix} -10 & 4 \\ -x & -6-2y \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 8 & 4y+12 \end{bmatrix}$$