

Homework: Matrix Operations - Key

In Problems 1-4, find the following matrices: a) $A + B$ b) $A - B$
c) $-3A$ d) $2A - 5B$

1.

$$A + B = \begin{bmatrix} -2 & -5 \\ 9 & 6 \end{bmatrix}$$

$$A - B = \begin{bmatrix} 6 & -1 \\ -1 & -8 \end{bmatrix}$$

$$-3A = \begin{bmatrix} -6 & 9 \\ -12 & 3 \end{bmatrix}$$

$$2A - 5B = \begin{bmatrix} 24 & 4 \\ -17 & -37 \end{bmatrix}$$

2.

$$A + B = \begin{bmatrix} -7 & -9 & 7 \\ 15 & -6 & 6 \end{bmatrix}$$

$$A - B = \begin{bmatrix} 9 & -5 & -1 \\ -7 & -2 & -4 \end{bmatrix}$$

$$-3A = \begin{bmatrix} -3 & 21 & -9 \\ -12 & 12 & -3 \end{bmatrix}$$

$$2A - 5B = \begin{bmatrix} 42 & -4 & -14 \\ -47 & 2 & -23 \end{bmatrix}$$

3.

$$A + B = \begin{bmatrix} -6 \\ 7 \\ 1 \\ 1 \end{bmatrix}$$

$$A - B = \begin{bmatrix} 10 \\ -13 \\ 9 \\ -3 \end{bmatrix}$$

$$-3A = \begin{bmatrix} -6 \\ 9 \\ -15 \\ 3 \end{bmatrix}$$

$$2A - 5B = \begin{bmatrix} 44 \\ -56 \\ 30 \\ -12 \end{bmatrix}$$

4.

$$A + B = \begin{bmatrix} 3 & -7 & -3 \\ 6 & -2 & 8 \\ 11 & 11 & -5 \end{bmatrix}$$

$$A - B = \begin{bmatrix} 1 & 7 & -3 \\ 2 & 0 & 2 \\ 3 & -7 & -3 \end{bmatrix}$$

$$-3A = \begin{bmatrix} -6 & 0 & 9 \\ -12 & 3 & -15 \\ -21 & -6 & 12 \end{bmatrix}$$

$$2A - 5B = \begin{bmatrix} -1 & 35 & -6 \\ -2 & 3 & -5 \\ -6 & -41 & -3 \end{bmatrix}$$

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In Problems 5-9, find (if possible) the following matrices: a) AB b) BA

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|---|---|
| <p>5.</p> $AB = \begin{bmatrix} 15 & 11 \\ -26 & -21 \end{bmatrix}$ $BA = \begin{bmatrix} 7 & -2 \\ 31 & -13 \end{bmatrix}$ | <p>6.</p> $AB = [13]$ $BA = \begin{bmatrix} -12 & 18 & -30 & 6 \\ -4 & 6 & -10 & 2 \\ 6 & -9 & 15 & -3 \\ -8 & 12 & -20 & 4 \end{bmatrix}$ |
| <p>7.</p> $AB = \begin{bmatrix} 8 & -1 & -28 \\ -36 & 8 & 67 \\ 6 & -4 & 7 \end{bmatrix}$ $BA = \begin{bmatrix} -7 & 6 & -12 \\ 23 & 1 & 31 \\ 10 & -25 & 29 \end{bmatrix}$ | <p>8.</p> $AB = \begin{bmatrix} -27 & -28 \\ -16 & 58 \end{bmatrix}$ $BA = \begin{bmatrix} -4 & -9 & 40 \\ -2 & -1 & 4 \\ 46 & -5 & 36 \end{bmatrix}$ |
| <p>9.</p> $AB = \begin{bmatrix} -14 & 1 \\ -27 & 37 \end{bmatrix}$ $BA = \begin{bmatrix} -13 & 13 & -1 & 1 \\ 9 & 7 & -19 & 3 \\ -20 & -4 & 28 & -4 \\ 20 & -9 & -12 & 1 \end{bmatrix}$ | |

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In Problems 10-13, perform the indicated matrix operations given that A, B, and C are defined as follows or state that the operation is not possible.

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

| | |
|---|--|
| 10. $\begin{bmatrix} 8 & -11 \\ 19 & 8 \end{bmatrix}$ | 11. $\begin{bmatrix} -7 & -17 \\ 29 & -11 \end{bmatrix}$ |
| 12. Not Possible | 13. $\begin{bmatrix} 33 & 93 \\ -23 & -13 \\ 20 & -20 \end{bmatrix}$ |