

Basic Matrix Operations

Evaluate each expression. If it is undefined, explain which dimensions do not match.

1. $-4(A + B)$

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

2. $A - B$

$$A = \begin{bmatrix} 0 & 5 & -5 & -3 \\ -5 & -6 & 2 & 2 \\ -2 & 1 & 6 & 3 \\ -2 & -4 & -1 & -6 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 4 & -4 & -4 \\ -5 & -3 & -1 & 4 \\ 1 & 6 & -3 & -5 \\ 6 & 4 & 3 & -2 \end{bmatrix}$$

3. $A - B$

$$A = \begin{bmatrix} 4 & -1 & 4 \\ -1 & 0 & 0 \\ 1 & -6 & -1 \end{bmatrix} \quad B = \begin{bmatrix} -2 & -4 & 6 \\ -1 & -6 & -1 \\ 2 & -5 & -4 \end{bmatrix}$$

Basic Matrix Operations

Evaluate each expression. If it is undefined, explain which dimensions do not match.

4. $A - B$

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

5. $A - B$

$$A = \begin{bmatrix} 6 & 6 & 3 & -1 \\ 0 & 6 & -2 & -5 \\ -3 & 4 & 6 & -6 \\ -3 & -6 & 5 & -2 \end{bmatrix} \quad B = \begin{bmatrix} 1 & -6 & 2 & 4 \\ -3 & -4 & -3 & 5 \\ 3 & 5 & 2 & -1 \end{bmatrix}$$

6. $-4A$

$$A = \begin{bmatrix} 5 & 0 & -4 \\ -2 & 3 & 3 \\ -4 & -4 & -4 \\ -2 & -6 & -1 \end{bmatrix}$$

Basic Matrix Operations

Answer Key

Evaluate each expression. If it is undefined, explain which dimensions do not match.

1. $-4(A + B)$

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

Answer

Undefined: $(2 \times 4) + (2 \times 1)$. Addition and subtraction need equal matrix dimensions.

2. $A - B$

$$A = \begin{bmatrix} 0 & 5 & -5 & -3 \\ -5 & -6 & 2 & 2 \\ -2 & 1 & 6 & 3 \\ -2 & -4 & -1 & -6 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 4 & -4 & -4 \\ -5 & -3 & -1 & 4 \\ 1 & 6 & -3 & -5 \\ 6 & 4 & 3 & -2 \end{bmatrix}$$

Answer

$$\begin{bmatrix} -2 & 1 & -1 & 1 \\ 0 & -3 & 3 & -2 \\ -3 & -5 & 9 & 8 \\ -8 & -8 & -4 & -4 \end{bmatrix}$$

Result dimensions: 4×4

Basic Matrix Operations

Answer Key

Evaluate each expression. If it is undefined, explain which dimensions do not match.

3. $A - B$

$$A = \begin{bmatrix} 4 & -1 & 4 \\ -1 & 0 & 0 \\ 1 & -6 & -1 \end{bmatrix} \quad B = \begin{bmatrix} -2 & -4 & 6 \\ -1 & -6 & -1 \\ 2 & -5 & -4 \end{bmatrix}$$

Answer

$$\begin{bmatrix} 6 & 3 & -2 \\ 0 & 6 & 1 \\ -1 & -1 & 3 \end{bmatrix}$$

Result dimensions: 3×3

4. $A - B$

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

Answer

Undefined: $(3 \times 1) - (3 \times 4)$. Addition and subtraction need equal matrix dimensions.

5. $A - B$

$$A = \begin{bmatrix} 6 & 6 & 3 & -1 \\ 0 & 6 & -2 & -5 \\ -3 & 4 & 6 & -6 \\ -3 & -6 & 5 & -2 \end{bmatrix} \quad B = \begin{bmatrix} 1 & -6 & 2 & 4 \\ -3 & -4 & -3 & 5 \\ 3 & 5 & 2 & -1 \end{bmatrix}$$

Answer

Undefined: $(4 \times 4) - (3 \times 4)$. Addition and subtraction need equal matrix dimensions.

Basic Matrix Operations

Answer Key

Evaluate each expression. If it is undefined, explain which dimensions do not match.

6. $-4A$

$$A = \begin{bmatrix} 5 & 0 & -4 \\ -2 & 3 & 3 \\ -4 & -4 & -4 \\ -2 & -6 & -1 \end{bmatrix}$$

Answer

$$\begin{bmatrix} -20 & 0 & 16 \\ 8 & -12 & -12 \\ 16 & 16 & 16 \\ 8 & 24 & 4 \end{bmatrix}$$

Result dimensions: 4×3