

Row x Column
 \rightarrow \downarrow

Operations on Matrices WS

Name Key

Tell whether the matrices are equal or not equal.

1. $\begin{bmatrix} 5 & -1 & 7 \\ 1 \times 3 \end{bmatrix}$, $\begin{bmatrix} 5 \\ -1 \\ 7 \\ 3 \times 1 \end{bmatrix}$ Not equal

2. $\begin{bmatrix} 1 & 0 & -8 \\ 8 & 0 & 1 \end{bmatrix}$, $\begin{bmatrix} 1 & 0 & -8 \\ 8 & 0 & 1 \end{bmatrix}$ Equal

2×3 2×3

Perform the indicated operation, if possible. If not possible, state the reason.

3. $\begin{bmatrix} 4 & -2 \\ 0 & -6 \end{bmatrix} + \begin{bmatrix} 4 \\ -1 \end{bmatrix}$ can't add.
Entries do not correspond.

2×2 2×1

4. $\begin{bmatrix} 7 & -1 & 4 \\ 11 & -9 & 2 \end{bmatrix} + \begin{bmatrix} -3 & 0 & 6 \\ 3 & -2 & 4 \end{bmatrix} = \begin{bmatrix} 4 & -1 & 10 \\ 14 & -11 & 6 \end{bmatrix}$

2×3 2×3

5. $\begin{bmatrix} \frac{1}{2} & \frac{1}{4} \\ 2 & \frac{4}{8} \\ 3 & \frac{2}{2} \end{bmatrix} - \begin{bmatrix} 2 & \frac{3}{4} \\ \frac{1}{2} & 5 \end{bmatrix} = \begin{bmatrix} -\frac{1}{2} & -\frac{1}{2} \\ 2\frac{1}{2} & -1 \end{bmatrix}$

2×2 2×2

6. $\begin{bmatrix} 1 & 5 \\ 5 & -1 \\ 2 & 8 \end{bmatrix} - \begin{bmatrix} 7 & 3 & 6 \\ -9 & -2 & 7 \\ 10 & 1 & -4 \end{bmatrix}$ can't subtract.
Entries do not correspond.

3×2 3×3

7. $2 \begin{bmatrix} 7 & -8 \\ -1 & 2 \end{bmatrix} + 4 \begin{bmatrix} 2 & -3 \\ -4 & 5 \end{bmatrix}$

$\begin{bmatrix} 14 & -16 \\ -2 & 4 \end{bmatrix} + \begin{bmatrix} 8 & -12 \\ -16 & 20 \end{bmatrix}$

$\begin{bmatrix} 22 & -28 \\ -18 & 24 \end{bmatrix}$

8. $\begin{bmatrix} -6 & -10 & 2 \\ 3 & -7 & -4 \end{bmatrix} - 2 \begin{bmatrix} 4 & -1 & -3 \\ -7 & 5 & 5 \end{bmatrix}$

$\begin{bmatrix} -6 & -10 & 2 \\ 3 & -7 & -4 \end{bmatrix} + \begin{bmatrix} -8 & 2 & 6 \\ 14 & -10 & -10 \end{bmatrix}$

$\begin{bmatrix} -14 & -8 & 8 \\ 17 & -17 & -14 \end{bmatrix}$

Solve the matrix equation for x and y.

9. $2x \begin{bmatrix} -3 & 4 \\ -11 & 5 \end{bmatrix} = \begin{bmatrix} 12 & -16 \\ y & -20 \end{bmatrix}$

$\begin{bmatrix} -6x & 8x \\ -22x & 10x \end{bmatrix} = \begin{bmatrix} 12 & -16 \\ y & -20 \end{bmatrix}$

$-6x = 12$ $-22x = y$

$x = -2$ $-22(-2) = y$ $y = 44$

10. $\begin{bmatrix} 3x & -2 \\ -1 & 8 \end{bmatrix} + \begin{bmatrix} -4 & 0 \\ -7 & -8 \end{bmatrix} = \begin{bmatrix} -16 & -2 \\ y & 0 \end{bmatrix}$

$3x - 4 = -16$ $-1 - 7 = y$

$3x = -12$ $y = -8$

$x = -4$

11. $\begin{bmatrix} -2x & -8 \\ -10 & -9 \end{bmatrix} = \begin{bmatrix} 6 & y \\ -10 & -9 \end{bmatrix}$

$-2x = 6$ $-8 = y$

$x = -3$ $y = -8$

12. $\begin{bmatrix} -3 & -7 & 2 \\ 4 & 8 & 1 \end{bmatrix} + \begin{bmatrix} x & 7 & -9 \\ -5 & -7 & 4 \end{bmatrix} = \begin{bmatrix} -8 & 0 & -7 \\ -1 & y & 5 \end{bmatrix}$

$-3 + x = -8$ $8 + -7 = y$

$x = -5$ $y = 1$