

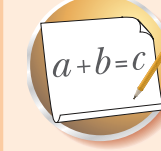
To add or subtract matrices, you must first check whether the matrices have the same order, which is the number of horizontal rows and vertical columns within a matrix. Only matrices of the same order can be added or subtracted.

To add matrices together, add the corresponding elements in each matrix and place the answers in a third matrix that has the same order as the matrices you are adding. For example, add the value in the top left position in the first matrix to the value in the top left position in the second matrix. Then place the answer in the top left position in a new matrix. Repeat these steps for

each element in the matrices. You subtract matrices in the same fashion, subtracting the elements in one matrix from the corresponding elements in another.

There are many real life examples of why you might want to add or subtract matrices. For instance, say you run a clothing store and want to gauge the skills of your sales staff. You could create a matrix for each month, with rows representing each salesperson and columns representing sales in each category of clothing. You could then subtract the matrices to find each salesperson's monthly increase or decrease in sales for each clothing category.

Practice



1) Add matrix A and matrix B and write the results in a new matrix labelled C. You can check your answers on page 258.

2) Subtract matrix B from matrix A and write the results in a new matrix labelled D. You can check your answers on page 258.

$$A = \begin{bmatrix} 6 & -3 & -8 \\ -7 & 5 & 1 \\ 4 & 2 & -5 \end{bmatrix} \quad B = \begin{bmatrix} 5 & -9 & 1 \\ -3 & -10 & 4 \\ 6 & -8 & 2 \end{bmatrix}$$

Add Matrices

$$A = \begin{bmatrix} 1 & 2 & -5 \\ -2 & 4 & 6 \\ 5 & -8 & 15 \end{bmatrix}$$

Columns

Rows

$$B = \begin{bmatrix} 3 & -6 & 9 \\ 5 & 8 & 11 \\ -4 & -7 & -5 \end{bmatrix}$$



$$A + B = \begin{bmatrix} 1 + 3 & 2 + (-6) & -5 + 9 \\ -2 + 5 & 4 + 8 & 6 + 11 \\ 5 + (-4) & -8 + (-7) & 15 + (-5) \end{bmatrix}$$

$$C = \begin{bmatrix} 4 & -4 & 4 \\ 3 & 12 & 17 \\ 1 & -15 & 10 \end{bmatrix}$$

Subtract Matrices

$$X = \begin{bmatrix} 12 & 8 & 7 \\ 6 & -3 & 6 \\ -2 & 10 & -4 \end{bmatrix}$$

Columns

Rows

$$Y = \begin{bmatrix} 6 & 2 & -5 \\ 12 & 7 & 14 \\ -8 & -9 & 10 \end{bmatrix}$$



$$X - Y = \begin{bmatrix} 12 - 6 & 8 - 2 & 7 - (-5) \\ 6 - 12 & -3 - 7 & 6 - 14 \\ -2 - (-8) & 10 - (-9) & -4 - 10 \end{bmatrix}$$

$$Z = \begin{bmatrix} 6 & 6 & 12 \\ -6 & -10 & -8 \\ 6 & 19 & -14 \end{bmatrix}$$

- To add two matrices together, both matrices must have the same number of rows and columns.

Note: In this example, each matrix has three rows and three columns.

- Add the top left number in the first matrix to the number in the same position in the second matrix.
- Write your result in the same position in a new matrix. In this example, we call the new matrix C.
Note: The new matrix will have the same number of rows and columns as the original matrices.
- Repeat steps 1 and 2 for each pair of corresponding numbers in the matrices.

- For example, add the top left number in matrix A, which is 1, to the top left number in matrix B, which is 3.

- To subtract matrices, both matrices must have the same number of rows and columns.

Note: In this example, each matrix has three rows and three columns.

- Subtract the top left number in the second matrix from the number in the same position in the first matrix.
- Write your result in the same position in a new matrix. In this example, we call the new matrix Z.
Note: The new matrix will have the same number of rows and columns as the original matrices.
- Repeat steps 1 and 2 for each pair of corresponding numbers in the matrices.

- For example, subtract the top left number in matrix Y, which is 6, from the top left number in matrix X, which is 12.