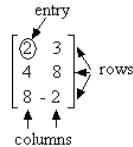# Study Guide

Add Matrices
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Add Matrices

A <u>matrix</u> is an array of numbers arranged in rows and columns.   Rows are horizontal and columns are vertical.   An <u>entry</u> is a number in the matrix.

The plural of matrix is "matrices."   Two matrices can be added together, if they have the same number of rows and the same number of columns.   Addition of matrices is done by adding corresponding entries, or entries that are in the same position within their respective matrix.

A matrix with 2 rows and 3 columns is identified as a 2×3 matrix, and a matrix with 3 rows and 2 columns is a 3×2 matrix.   The number of rows is indicated first, and the number of columns is indicated second.

Example 1: Add the following 2×2 matrices.

$$\begin{bmatrix} 3 & -8 \\ 4 & 20 \end{bmatrix} + \begin{bmatrix} 8 & -4 \\ -15 & -7 \end{bmatrix} =$$
(1)

$$\begin{bmatrix} 3 & -8 \\ 4 & 20 \end{bmatrix} + \begin{bmatrix} 8 & -4 \\ -15 & -7 \end{bmatrix}$$
(2)

$$\begin{bmatrix} 3+8 & -8+-4 \\ 4+-15 & 20+-7 \end{bmatrix}$$
(3)

$$\begin{bmatrix} 11 & -12 \\ -11 & 13 \end{bmatrix}$$

<u>Step 1:</u> Rewrite the problem.
<u>Step 2:</u> Add corresponding entries.
<u>Step 3:</u> Simplify.

Answer: $\begin{bmatrix} 11 & -12 \\ -11 & 13 \end{bmatrix}$

Example 2: Add the following matrices.

$$\begin{bmatrix} -12 & 6 & 10 \\ 7 & 3 & -8 \\ -13 & 4 & 20 \end{bmatrix} + \begin{bmatrix} 14 & 3 & 4 \\ 8 & -4 & 5 \\ -15 & -7 & 3 \end{bmatrix} =$$

(1)

$$\begin{bmatrix} -12 & 6 & 10 \\ 7 & 3 & -8 \\ -13 & 4 & 20 \end{bmatrix} + \begin{bmatrix} 14 & 3 & 4 \\ 8 & -4 & 5 \\ -15 & -7 & 3 \end{bmatrix}$$

(2)

$$\begin{bmatrix} -12+14 & 6+3 & 10+4 \\ 7+8 & 3+-4 & -8+5 \\ -13+-15 & 4+-7 & 20+3 \end{bmatrix}$$

(3)

$$\begin{bmatrix} 2 & 9 & 14 \\ 15 & -1 & -3 \\ -28 & -3 & 23 \end{bmatrix}$$

<u>Step 1:</u> Rewrite the problem.
<u>Step 2:</u> Add corresponding entries.
<u>Step 3:</u> Simplify.

Answer: $\begin{bmatrix} 2 & 9 & 14 \\ 15 & -1 & -3 \\ -28 & -3 & 23 \end{bmatrix}$

An activity that can help reinforce the concept of matrices is to ask the value of the entry in a given row and column in a matrix. After the student is able to identify entries, ask him or her to add the corresponding entries.