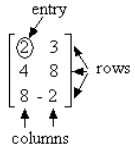
Study Guide

Scalar Multiplication with Matrices
02/29/2012

Scalar Multiplication With Matrices

A matrix is an array of numbers arranged in rows and columns. Rows are horizontal and columns are vertical. A scalar is a real number that can be multiplied by a matrix. In scalar multiplication, each entry is multiplied by the scalar. An entry is a number in the matrix.



Example 1: Multiply the matrix by the scalar.

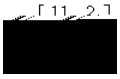
$$3\begin{bmatrix}1 & 4\\ -1 & 9\end{bmatrix}$$

(1) $3\begin{bmatrix}1 & 4\\ -1 & 9\end{bmatrix}$ **(2)** $\begin{bmatrix}(3)(1) & (3)(4)\\ (3)(-1) & (3)(9)\end{bmatrix}$ **(3)** $\begin{bmatrix}3 & 12\\ -3 & 27\end{bmatrix}$

Step 1: Rewrite the problem.
Step 2: Multiply each entry in the matrix by the scalar, 3.
Step 3: Simplify.

Answer: $\begin{bmatrix}3 & 12\\ -3 & 27\end{bmatrix}$

Example 2: Multiply the matrix by the scalar.



(1) $-2\begin{bmatrix}11 & 2\\ -9 & 12\\ -6 & 3\end{bmatrix}$ **(2)** $\begin{bmatrix}(-2)(11) & (-2)(2)\\ (-2)(-9) & (-2)(12)\\ (-2)(-6) & (-2)(3)\end{bmatrix}$ **(3)** $\begin{bmatrix}-22 & -4\\ 18 & -24\\ 12 & -6\end{bmatrix}$

Step 1: Rewrite the problem.
Step 2: Multiply each entry in the matrix by the scalar, - 2.
Step 3: Simplify.

Answer: $\begin{bmatrix}-22 & -4\\ 18 & -24\\ 12 & -6\end{bmatrix}$