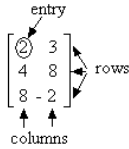


# Study Guide

## 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)                      (2)                      (3)

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

**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.

$$-2 \begin{bmatrix} 11 & 2 \\ -9 & 12 \\ -6 & 3 \end{bmatrix}$$

(1)                      (2)                      (3)

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

**Step 1:** Rewrite the problem.

**Step 2:** Multiply each entry in the matrix by the scalar, -2.

**Step 3:** Simplify.

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