3.5 Matrices and Data

Objective: Find sums, differences, and scalar products of matrices.

A matrix is____

Matrices are described or classified by: ____

The dimensions of a matrix are always written as: _________________________________

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$$A = \begin{bmatrix} 16.781 & 16.29 & 17.318 \\ 16.206 & 16.606 & 17.668 \end{bmatrix} \begin{matrix} \leftarrow \text{Row 1} \\ \leftarrow \text{Row 2} \end{matrix}$$

$$\begin{matrix} \uparrow & \uparrow & \uparrow \\ \text{Column 1} & \text{Column 2} & \text{Column 3} \end{matrix}$$

Matrix A has two rows and three columns. A matrix with m rows and n columns has **<u>dimensions</u>** $m \times n$, read "m by n," and is called an $m \times n$ matrix. THE DIMENSIONS ARE ALWAYS ROWS BY COLUMNS!!!!

Examples: $M = \begin{bmatrix} 3 & 2 \\ -6 & 4 \\ -1 & -5 \end{bmatrix}$ $N = \begin{bmatrix} 5 \\ 6 \\ 7 \end{bmatrix}$ $D = \begin{bmatrix} 6 & -3 & 8 \end{bmatrix}$

The address of an entry is its location in the matrix. Addresses are expressed using: ________________

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What are the dimensions of the following matrix? $P = \begin{bmatrix} 3.95 & 5.95 \\ 3.75 & 5.60 \\ 3.50 & 5.25 \end{bmatrix}$

What is the address of 5.60?

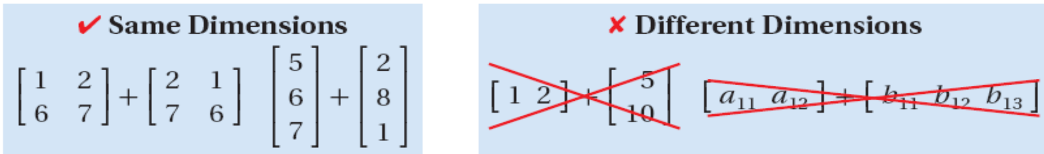
What number has the address a_{21}?

Solve: $p_{21} + p_{32} =$

Adding and subtracting matrices:

To add or subtract matrices, just add or subtract the corresponding entries.

**********You can add or subtract two matrices only if they have the *__same__* dimensions.**********



Add or subtract if possible:

$$W = \begin{bmatrix} 3 & -2 \\ 1 & 0 \end{bmatrix}, \quad X = \begin{bmatrix} 4 & 7 & 2 \\ 5 & 1 & -1 \end{bmatrix}, \quad Y = \begin{bmatrix} 1 & 4 \\ -2 & 3 \end{bmatrix}, \quad Z = \begin{bmatrix} 2 & -2 & 3 \\ 1 & 0 & 4 \end{bmatrix}$$

W + Y =

X – Z =

You can multiply a matrix by a number, called a **__scalar__**. To find the product of a scalar and a matrix, or the *scalar product*, multiply each entry by the scalar.

Calculate 2W:

Calculate 3Z – Y:

Calculate 3X + 4Z

Calculate 2W – 3Y