

Math 1324

Section 3.1

An Introduction to Matrices

The videos corresponding to this worksheet can be found at

<https://online.math.uh.edu/Math1324/>.

UH students can alternatively view the videos within the Math 1324 textbook.

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A **matrix** (*plural* matrices) is a rectangular array of numbers, letters, symbols, or algebraic expressions that are arranged in rows and columns.

Each number, letter, symbol, or algebraic expression in a matrix is called an **element** or an

entry. Each element has a specific location in the matrix denoted by a_{ij} , where i is the row number and j is the column number.

The **dimension**, or **size**, of a matrix is defined by the number of rows and columns in a matrix.

A matrix with a single row is called a **row matrix** or a **row vector**. A matrix with a single column is called a **column matrix** or a **column vector**.

Example 1: Given the following matrix:

$$A = \begin{pmatrix} -9 & 1 & 0 & 6 & 99 \\ 4 & -3 & -1 & 0 & 0 \\ 8 & 11 & 12 & 4 & 7 \end{pmatrix}$$

- a. What is the size of A?
- b. Find a_{24} , a_{15} , a_{35} , and a_{33} .

Example 2: Write the augmented matrix corresponding to the given system of equations.

$$\begin{aligned} 8x - 10y &= 4 \\ -4y &= 3 \end{aligned}$$

Example 3: Write the system of equations corresponding to the given augmented matrix.

$$\left(\begin{array}{cc|c} -3 & 9 & 10 \\ 7 & -4 & 2 \end{array} \right)$$