

Magnet Precalculus CD Matrices

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Chapter 1

1.1 Introduction to Matrices

Definition 1.1.1: Matrix

A **matrix** is a rectangular array of variables or constants in rows or columns, usually enclosed in brackets. These constants or variables are known as **elements**.

Definition 1.1.2: Element

An element is an individual value within a matrix. Given a matrix A , a given element in side of A is notated as A_{xy} , where x is the row and y is the column in which the element is located.

Note:-

If either the width or height of a matrix is more than one digit, x and y in element notation are generally separated by a dash (e.g. A_{10-4})

Example 1.1.1 (Find an Element of a Matrix)

$$A = \begin{bmatrix} -8 & 40 & 0 & -1 & 21 \\ 27 & 32 & -29 & 6 & -2 \\ 5 & -7 & 14 & 52 & -35 \end{bmatrix}$$
$$A_{12} = 40$$
$$A_{34} = 52$$

1.2 Summation of Matrices

Matrices can be summed **only if their dimensions are the same**. The process is as simple as summing all corresponding elements.

Example 1.2.1 (Sum of Two Matrices)

$$W = \begin{bmatrix} -1 & 9 \\ -11 & 15 \\ 8 & -20 \end{bmatrix}$$
$$Z = \begin{bmatrix} -3 & -2 \\ -16 & 0 \\ 12 & 9 \end{bmatrix}$$
$$W + Z = \begin{bmatrix} -4 & 7 \\ -27 & 15 \\ 20 & -11 \end{bmatrix}$$

$$W - Z = \begin{bmatrix} 2 & 11 \\ 5 & 15 \\ -4 & -29 \end{bmatrix}$$