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CHAPTER 5. MATRICES AND DETERMINANTS

5.3 Matrices

525. Definition

An $m \times n$ matrix A is a rectangular array of elements (numbers or functions) with m rows and n columns.

$$\mathbf{A} = \begin{bmatrix} \mathbf{a}_{11} & \mathbf{a}_{12} & \dots & \mathbf{a}_{1n} \\ \mathbf{a}_{21} & \mathbf{a}_{22} & \dots & \mathbf{a}_{2n} \\ \vdots & \vdots & & \vdots \\ \mathbf{a}_{m1} & \mathbf{a}_{m2} & \dots & \mathbf{a}_{mn} \end{bmatrix}$$

- **526.** Square matrix is a matrix of order $n \times n$.
- **527.** A square matrix $[a_{ij}]$ is symmetric if $a_{ij} = a_{ji}$, i.e. it is symmetric about the leading diagonal.
- **528.** A square matrix $[a_{ij}]$ is skew-symmetric if $a_{ij} = -a_{ji}$.
- **529.** Diagonal matrix is a square matrix with all elements zero except those on the leading diagonal.
- **530.** Unit matrix is a diagonal matrix in which the elements on the leading diagonal are all unity. The unit matrix is denoted by I.
- **531.** A null matrix is one whose elements are all zero.