

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.

$$A = [a_{ij}] = \begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \vdots & \vdots & & \vdots \\ a_{m1} & a_{m2} & \dots & a_{mn} \end{bmatrix}$$

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.