Matriks

$A = \begin{bmatrix} 1 & 0 & 5 \\ -2 & 4 & -6 \end{bmatrix}$

Peringkat matriks $A = 2 \times 3$

Unsur $\rightarrow a_{ij}$ (baris ke-i, lajur ke-j)

e.g.:- $1 = a_{11}$

$4 = a_{22}$

Matriks sama $\Rightarrow$ Peringkat sama
Semua unsur sepadan sama

Operasi Asas Matriks

$A + B = B + A$

$A - B \neq B - A$

$(A+B) + C = A + (B+C)$

* $(A-B) - C \neq A - (B-C)$ ✓

Extra Aritmetik $\rightarrow$ $a \times b = b \times a$

$(a \times b) \times c = a \times (b \times c)$

e.g.:- $M - \begin{bmatrix} -8 \\ -3 \end{bmatrix} = \begin{bmatrix} 1 \\ 5 \end{bmatrix} - \begin{bmatrix} -6 \\ 2 \end{bmatrix}$

$M = \begin{bmatrix} 1 \\ 5 \end{bmatrix} - \begin{bmatrix} -6 \\ 2 \end{bmatrix} + \begin{bmatrix} -8 \\ -3 \end{bmatrix}$

$= \begin{bmatrix} 1+6-8 \\ 5-2-3 \end{bmatrix} = \begin{bmatrix} -1 \\ 0 \end{bmatrix}$

Aplikasi Matriks

$ax + by = h$

$cx + dy = k$

$\begin{bmatrix} a & b \\ c & d \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} h \\ k \end{bmatrix}$

$\therefore \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}^{-1} \begin{bmatrix} h \\ k \end{bmatrix}$

* Pendaraban Skalar

$\Rightarrow k(A+B) = kA + kB$

$k(A-B) = kA - kB$

e.g.:- $\begin{bmatrix} -6 \\ 9 \end{bmatrix} + 2M = 3\begin{bmatrix} 5 \\ -1 \end{bmatrix} - M$

$2M + M = \begin{bmatrix} 15 \\ -3 \end{bmatrix} - \begin{bmatrix} -6 \\ 9 \end{bmatrix}$

$3M = \begin{bmatrix} 21 \\ -12 \end{bmatrix}$

$M = \frac{1}{3}\begin{bmatrix} 21 \\ -12 \end{bmatrix}$

$= \begin{bmatrix} 7 \\ -4 \end{bmatrix}$ *.

Pendaraban Matriks

$A \times B = AB$

$[p \times m]\ [n \times q] = p \times q$.

jika $m = n$ maka boleh.

e.g.:- $\begin{bmatrix} 2 \\ -3 \end{bmatrix} \begin{bmatrix} 5 & 1 \end{bmatrix}$ $\quad 2 \times 1 \,|\, 1 \times 2$ $\hookrightarrow 2 \times 2$

$= \begin{bmatrix} 10 & 2 \\ -15 & -3 \end{bmatrix}$ *.

* Matriks Identiti

$AI = A$ dan $IA = A$.

$\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ $\rightarrow$ Contoh I

$\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Matriks Songsang

$\Rightarrow$ Jika $AB = BA = I$

maka $A = B^{-1}$ atau $B = A^{-1}$

$AA^{-1} = A^{-1}A = I$

Jika $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$$A^{-1} = \frac{1}{ad-bc}\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$