Basics of Mathematics

Tuesday, 12 March 2024

Tag Lines:

Outline:

$\mathbb{N} \in \mathbb{Z}$

$\mathbb{Z} \in \mathbb{Q}$ (int. rational numbers)

$\mathbb{Q} \in \mathbb{R}$ (rational numbers)

$\mathbb{R} \in \mathbb{C}$ (real numbers)

$\mathbb{R} \in \mathbb{C}$ (complex numbers)

$\mathbb{R}$ - Vectors in $\mathbb{R}^n$

$\mathbb{R}^2$: $\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$

$\mathbb{R}^3$: $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$

$\mathbb{R}^n$: $\{x_1, x_2, \ldots, x_n\}$ (n)

$\mathbb{R}_{m \times n}$ & $\mathbb{R}^{m \times n}$

$\mathbb{R} \times \mathbb{R}$ & $\mathbb{R}^2$

$\mathbb{R} \times \mathbb{R} \times \mathbb{R}$ & $\mathbb{R}^3$

$\mathbb{R}^n$: $\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix}$

Straight line in $\mathbb{R}^2$ & $\mathbb{R}^3$ (vectors):

$\mathbb{R}^2$: $\begin{bmatrix} x_1 \\ x_2 \end{bmatrix}$

$\mathbb{R}^3$: $\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$

$\mathbb{R}^n$: $\begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix}$

$x_1, x_2, \ldots, x_n$

Dot product & dot product:

Cross product & cross:

$\mathbb{R}_n$ & $\mathbb{R}^n$

$\mathbb{R}_n \times \mathbb{R}_n$ & $\mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Dot product:

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Cross product:

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Dot product: $\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Cross product: $\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Dot product:

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Cross product:

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Dot product: $\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

$\mathbb{R}^n \times \mathbb{R}^n \to \mathbb{R}^n$

Cross product: $