

Basic Maths for Non-mathematicians

Peleg Bar Sapi

$$\int_a^b f(x) dx = \lim_{\Delta x \rightarrow 0} \sum_{k=1}^N f(x_k) \Delta x$$

$$(AB)^\top = B^\top A^\top \quad \mathbb{R}^n \xrightarrow{T} \mathbb{R}^m$$

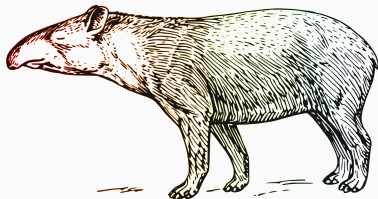
$$\vec{v} = \sum_{i=1}^n \alpha_i \hat{e}_i \quad A = Q \Lambda Q^{-1}$$

$$\frac{df}{dx} = \lim_{\Delta x \rightarrow 0} \frac{f(x+\Delta x) - f(x)}{\Delta x}$$

$$\text{Rot}(\theta) = \begin{bmatrix} \cos(\theta) & -\sin(\theta) \\ \sin(\theta) & \cos(\theta) \end{bmatrix} \quad A\vec{v} = \lambda\vec{v}$$

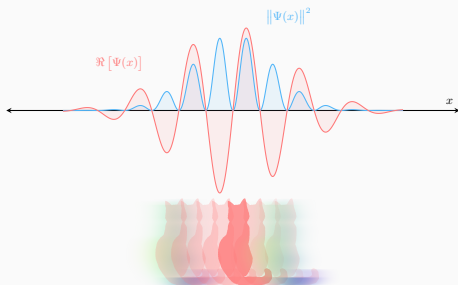
$$\int_a^b f(x) dx = F(b) - F(a)$$

$$T(\alpha\vec{u} + \beta\vec{v}) = \alpha T(\vec{u}) + \beta T(\vec{v}) \quad \langle \hat{e}_i, \hat{e}_j \rangle = \delta_{ij}$$



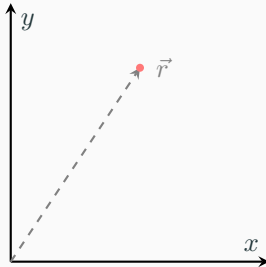
Chapter 10: Linear Algebra, Calculus and (a bit of) Quantum Physics

$$i\hbar \frac{\partial}{\partial t} |\Psi(t)\rangle = \hat{H} |\Psi(t)\rangle$$



Classical Mechanics

In **classical mechanics** we characterize a point-like particle as having a well-defined **position** represented as an \mathbb{R}^3 vector:



A particle also has a **velocity** (change of position over time), which is also represented by an \mathbb{R}^3 vector:

