Sample Equations

The Lorenz Equations

$$\begin{aligned}\dot{x} &= \sigma(y - x)\\ \dot{y} &= \rho x - y - xz\\ \dot{z} &= -\beta z + xy\end{aligned}$$

The Cauchy-Schwarz Inequality

$$\left(\sum_{k=1}^{n} a_k b_k\right)^2 \leq \left(\sum_{k=1}^{n} a_k^2\right) \left(\sum_{k=1}^{n} b_k^2\right)$$

A Cross Product Formula

$$\mathbf{V}_1 \times \mathbf{V}_2 = \begin{vmatrix} \mathbf{i} & \mathbf{j} & \mathbf{k} \\ \frac{\partial X}{\partial u} & \frac{\partial Y}{\partial u} & 0 \\ \frac{\partial X}{\partial v} & \frac{\partial Y}{\partial v} & 0 \end{vmatrix}$$

The probability of getting k heads when flipping n coins is:

$$P(E) = \binom{n}{k} p^k (1-p)^{n-k}$$

An Identity of Ramanujan

$$\frac{1}{(\sqrt{\phi\sqrt{5}}-\phi) e^{\frac{2}{5}\pi}} = 1 + \frac{e^{-2\pi}}{1+\frac{e^{-4\pi}}{1+\frac{e^{-6\pi}}{1+\frac{e^{-8\pi}}{1+\ldots}}}}$$

A Rogers-Ramanujan Identity

$$1 + \frac{q^2}{(1-q)} + \frac{q^6}{(1-q)(1-q^2)} + \cdots = \prod_{j=0}^{\infty} \frac{1}{(1-q^{5j+2})(1-q^{5j+3})}, \qquad \text{for } |q| < 1$$

Maxwell's Equations

$$\begin{aligned} \nabla \times \vec{\mathbf{B}} - \frac{1}{c}\frac{\partial \vec{\mathbf{E}}}{\partial t} &= \frac{4\pi}{c}\vec{\mathbf{j}} \\ \nabla \cdot \vec{\mathbf{E}} &= 4\pi\rho \\ \nabla \times \vec{\mathbf{E}} + \frac{1}{c}\frac{\partial \vec{\mathbf{B}}}{\partial t} &= \vec{\mathbf{0}} \\ \nabla \cdot \vec{\mathbf{B}} &= 0 \end{aligned}$$

In-line Mathematics

While display equations look good for a page of samples, the ability to mix math and text in a paragraph is also important. This expression $\sqrt{3x-1}+(1+x)^2$ is an example of an inline equation. As you see, equations can be used this way as well, without unduly disturbing the spacing between lines.

References to equations

Here is a reference to the Lorenz Equations (1). Clicking on the equation number will take you back to the equation.