

Mathematical Expression

Supto

November 24, 2024

1 .Basics Math

$$\frac{(x+1)^2}{(x+5)^3}$$

$$F(x) = x^2 + 45 + 3$$

2 .Superscript

$$1.2x^{34}$$

$$2.2x^{3x+4}$$

$$3.2x^{3x^{34}+5}$$

3 .subscript

$$1.x_1$$

$$2.x_{12}$$

$$3.x_{1_{2_3}}$$

$$4.a_0, a_1, a_2, \dots, a_{100}$$

4 .Greek letters ::

$$1.\pi, \Pi, \alpha, \beta, \omega, \sigma, \delta, \Delta, \Sigma, \Omega, \phi$$

$$2.\text{area} = \pi r^2$$

$$3.\text{circle volume} = \frac{4\pi r^3}{3}$$

5 .Trigonometry Function

$$1.y = \sin x \cos x \sec x$$

$$2.y = \sin^{-1} x$$

$$3.y = \arcsin x$$

$$4. \tan(a+b) = \frac{\tan(a) + \tan(b)}{1 + \tan(a) \tan(b)}$$

$$5. \tan^{-1}(a+b) = \tan^{-1} \frac{a+b}{1+ab}$$

$$6. \sin 2\theta = 2 \sin \theta \cos \theta$$

$$7. 4 \sin^3 \theta = 3 \sin \theta + \sin 3\theta$$

$$8. \ln(\sin^7 \theta + \cos^9 \theta) = \ln \sin^2 \theta$$

$$9. \sin^{-7} \theta + \cos^{-7} \theta = \frac{\pi}{2}$$

$$10. \sin \theta = \frac{e^{j\theta} - e^{-j\theta}}{2j}$$

6 Log function:

$$1.y = \log_{10} x$$

$$2.y = \log_5 x$$

$$3.y = \ln x$$

$$4. \log_{10} e^{\frac{\log_8 x}{2}}$$

$$5. \ln \frac{e^{x-1} \left[\frac{0}{1} \right]}{2x \frac{H}{H}} = \frac{1}{2}$$

$$6. (z_1 z_2)^w = \log z_1^w z_2^w$$

$$7. \log(z) = \ln r + i\Theta \quad (r > 0, -\pi \geq \theta > -\pi)$$

$$F8. \{f(t)\} = \int_{-\infty}^{\infty} f(t) e^{-i2\pi f(t)} dt + \log_{10}(5x) \ln \cos \theta$$

7 Root ::

1. $\sqrt{2}$
2. $\sqrt[3]{2}$
3. $\sqrt{x^2 + y^2}$
4. $\sqrt{1 + \sqrt{x}}$
5. $\frac{\sqrt{1 + x^2}}{\sqrt{\sqrt{5}e^4 + 3e^{7e}}}$
6. $\frac{\sqrt{1 + \sqrt{x}}}{1 + \sqrt{\frac{1}{4x}}}$
7. $\frac{\frac{a}{b}}{\frac{b}{c}}$

8 Fractions:

1. $\frac{2}{3}$
2. about $\frac{2}{3}$.of the gallon of $\frac{2}{5}$ This is the part of $\frac{2}{5}$
3. $\frac{\sqrt{x^2 + 1}}{\sqrt{x^3 + 3}}$
4. $\frac{\sqrt{x^2 + y^2}}{\sqrt{x + \sqrt[2]{x}}} = y + 5$
5. $\frac{x^n + y^n}{x^n} = z^n$
6. $\frac{1}{1 + \frac{1}{x}}$
7. $\frac{mc^2}{\sqrt{1 + \frac{v^2}{c^2}}}$
8. $a_0 + \frac{1}{a_1 + \frac{1}{a_2 + \frac{1}{a_2 + \frac{1}{a_3 + \frac{1}{a_4}}}}}$
9. $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2ab}$
10. $\left[\frac{x + y}{x - y} \right]$

9 function

1.

$$y = a + f(\underbrace{\quad}_{\geq 0 \text{ by assumption}} \underbrace{bx}_{\geq 0 \text{ by assumption}}) = a + f(\underbrace{bx}_{\geq 0 \text{ by assumption}})$$

$$2. |x| = \begin{cases} x, & \text{if } x \geq 10 \\ -x, & \text{if } x \leq 5 \end{cases}$$

10 Calculus::

$$\sum_{n=0}^{20} x^2 = 200$$

$$\sum_{n=0}^{\infty} x^3 + 5 = 2$$

$$\prod_{n=0}^{\infty} x^4 = 36$$

$$\sum_1^{\infty} \frac{(-1)^n n^2}{(2n+1)!} = \log x$$

$$\int_0^1 \frac{1}{1+x^2}$$

$$\sum_1^{\infty} \frac{1}{n^2}$$

$$\lim_{x \rightarrow 6} x^2 + 8 = 25$$

$$\lim_{x \rightarrow \infty} 3x + 5 = 45$$

10.1 Integrals::

$$1. \int_0^7 5y = 25$$

$$2. \int_0^{\infty} 25x^4 = ?$$

$$3. \int \int_0^{0.5} x^4 = ?$$

$$4. \int_0^7 f(x) \left[\frac{0}{5} \right]$$

$$5. \left[\tilde{f}(\omega) = \frac{1}{2\pi} \int_{-\infty}^{\infty} f(x) e^{-i\omega x} dx \right]$$

10.2 Differentiations::

$$\frac{dy}{dx}$$

10.3 partials derivatives::

$$\frac{\partial y}{\partial x}$$

Prime notations::

$$f'(x)$$

$$f''(x)$$

$$f^n(x)$$

11 SETS::

$$\{1, 2, 3\} \cap \{2, 4, 7\} = \{2\}$$

$$\{1, 2, 3\} \cup \{2, 4, 6\} = \{1, 3, 4, 6\}$$

$$P \oplus Q$$

$$p(a \cap b) = \frac{p(a)p(b)}{p(a) + p(b)}$$

12 Matrix

$$\begin{bmatrix} 1 & x & 0 \\ 0 & 1 & -1 \end{bmatrix} \begin{bmatrix} 1 \\ y \\ 1 \end{bmatrix} = \begin{bmatrix} 1+xy \\ y-1 \end{bmatrix}$$

$$\begin{pmatrix} 1 & 3 & 4 \\ 5 & 6 & 7 \\ 8 & 9 & 10 \end{pmatrix} v = \begin{pmatrix} 1 & 2 & 5 \\ 4 & 7 & 8 \\ 1 & 5 & 7 \end{pmatrix}$$

$$\begin{bmatrix} -2 & 1 & 0 & 0 & \cdots & 0 \\ 1 & -2 & 1 & 0 & \cdots & 0 \\ 0 & 1 & -2 & 1 & \cdots & \blacksquare \\ \blacksquare & \blacksquare & \blacksquare & -2 & \ddots & \vdots \\ 0 & 0 & 0 & \cdots & 1 & -2 \end{bmatrix}$$