Using LATEX for Mathematical Typing

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Formula Sheet

1 Quadratic Formula:

for any quadratic eqn.

$$ax^2 + bx + c = 0$$

we get the solution for x :

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

2 Trigonometric functions:

2.1 $\sin^2\theta + \cos^2\theta = 1$

2.2 $\tan^2\theta - \sec^2\theta = 1$

2.3 $\csc^2\theta - \cot^2\theta = 1$

2.4 $\cos^2\theta - \sin^2\theta = \cos 2\theta$

2.5 $\sin\left(\frac{\pi}{2} - \theta\right) = \cos\theta$

2.6 $\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$

3 Logarithmic :

3.1 $\log_a xy = \log_a x + \log_a y$

3.2 $\log_a \frac{x}{y} = \log_a x - \log_a y$

3.3 $\log_a x^n = n\log_a x$

3.4 $\log_a x = \frac{\log_b x}{\log_b a}$

4 Fibonacci series:

$$F_n = F_{n-1} + F_{n-2}$$

5 Limit:

5.1 $f(x) = \lim_{h\to 0} \frac{f(x+h)-f(x)}{h}$

5.2 $\prod_{i=1}^{n} i = n!$

6 Integrations :

6.1 $\int x^n dx = \frac{x^{n+1}}{n+1} + C$

6.2 $\int e^x dx = e^x + C$

6.3 $\int a^x dx = \frac{a^x}{\log a} + C$

6.4 $\int \cos x dx = \sin x + C$

6.5 $\int \sin x dx = -\cos x + C$

6.6 $\int \sec^2 x dx = \tan x + C$

6.7 $\int \csc^2 x dx = -\cot x + C$

6.8 $\int \sec x \tan x dx = \sec x + C$

6.9 $\int \csc x \cot x dx = -\csc x + C$

6.10 $\int \frac{1}{\sqrt{a^2-x^2}} dx = \sin^{-1} \frac{x}{a} + C$

6.11 $\int \frac{1}{x^2+1} dx = \tan^{-1} x + C$

6.12 $\int \frac{1}{x^2+a^2} dx = \frac{1}{a} \tan^{-1} \frac{x}{a} + C$

6.13 $\int \frac{1}{x\sqrt{x^2-a^2}} dx = \frac{1}{a} \sec^{-1} \frac{x}{a} + C; (x^2 > a^2)$

7 Series:

7.1 $\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$

7.2 $\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$

7.3 $\sum_{i=1}^{n} (2i-1) = n^2$

7.4 $\sum_{i=1}^{n} i(i+1) = \frac{n(n+1)(n+2)}{3}$

7.5 $\sum_{i=1}^{n} \frac{1}{i(i+1)} = \frac{n}{n+1}$

8 Derivation:

8.1 $\frac{d}{dx} x^n = nx^{n-1}$

8.2 $\frac{d}{dx} \log x = \frac{1}{x}$

8.3 $\frac{d}{dx} \sin x = \cos x$