Identitas Trigonometri

$\sin^2 x + \cos^2 x = 1$

$\sin(-x) = -\sin x$

$\cos(-x) = \cos x$

$\tan(-x) = -\tan x$

$\sin(90^\circ - x) = \cos x$

$\cos(90^\circ - x) = \sin x$

$\sin(x \pm y) = \sin x \cos y \pm \cos x \sin y$

$\cos(x \pm y) = \cos x \cos y \mp \sin x \sin y$

$\sin(2x) = 2 \sin x \cos x$

$\cos(2x) = \cos^2 x - \sin^2 x$
$= 2\cos^2 x - 1$
$= 1 - 2\sin^2 x$

$\sin x + \sin y = 2 \sin\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$

$\sin x - \sin y = 2 \cos\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$

$\cos x + \cos y = 2 \cos\left(\frac{x+y}{2}\right)\cos\left(\frac{x-y}{2}\right)$

$\cos x - \cos y = -2 \sin\left(\frac{x+y}{2}\right)\sin\left(\frac{x-y}{2}\right)$

Rumus Euler : $e^{ix} = \cos x + i \sin x$

Teorema De Moivre : $(\cos x + i \sin x)^n = \cos nx + i \sin nx,\ n \in \mathbb{Z}$

Ekspansi deret Taylor untuk* sin *x : $\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \ldots$

$$= \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n+1)!} \cdot x^{2n+1}$$

Ekspansi deret Taylor untuk* cos *x : $\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \ldots$

$$= \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!} \cdot x^{2n}$$

Limit Fungsi Trigonometri

$\lim_{x \to 0} \frac{\sin ax}{bx} = \frac{ax}{\sin bx} = \frac{\sin ax}{\sin bx} = \frac{a}{b}$

$\lim_{x \to 0} \frac{\tan ax}{bx} = \frac{ax}{\tan bx} = \frac{\tan ax}{\tan bx} = \frac{a}{b}$

$\lim_{x \to 0} \frac{\tan ax}{\sin bx} = \frac{\sin ax}{\tan bx} = \frac{a}{b}$

$\lim_{x \to 0} \frac{1 - \cos x}{x} = 0$

$\lim_{x \to 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$

***Aturan L'Hôpital* (L'H)** :

Jika $\lim_{x \to a} f(x) = \lim_{x \to a} g(x) = 0$ *atau* $\pm\infty$ *maka*

$\lim_{x \to a} \frac{f(x)}{g(x)} = \lim_{x \to a} \frac{f'(x)}{g'(x)} = \lim_{x \to a} \frac{f''(x)}{g''(x)} = \ldots$

Turunan Fungsi Trigonometri

$\frac{d}{dx}(\sin x) = \cos x$

$\frac{d}{dx}(\cos x) = -\sin x$

$\frac{d}{dx}(\tan x) = \sec^2 x$

$\frac{d}{dx}(\cot x) = -\csc^2 x$

$\frac{d}{dx}(\sec x) = \tan x \sec x$

$\frac{d}{dx}(\csc x) = -\csc x \cot x$

Aturan – Aturan Turunan

Aturan pangkat : $\frac{d}{dx}(ax^n) = nax^{n-1}$

Aturan kelipatan konstanta : $(c \cdot f)' = cf'$, *dengan c adalah konstanta*

Aturan fungsi konstan : $\frac{d}{dx}(c) = 0$

Aturan – aturan turunan Fungsi Komposisi
Untuk sembarang fungsi f, g, dan h, aturan – aturan berikut berlaku.

Aturan penjumlahan & pengurangan :
$(f \pm g)' = f' \pm g'$

Aturan perkalian :
$(f \cdot g)' = fg' + f'g$ (*kiri kanan aksen + kanan kiri aksen*)

Aturan pembagian :
$\left(\frac{f}{g}\right)' = \frac{gf' - fg'}{g^2}$ (*bawah atas aksen – atas bawah aksen, semuanya per bawah*^{2})

Aturan rantai :
Jika $h = (f \circ g)$ *maka* $h' = (f' \circ g) \cdot g'$