

# Turunan Fungsi Trigonometri

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1.  $f'(\sin x) = \cos x$
2.  $f'(\cos x) = -\sin x$

$$3. \frac{d(\tan x)}{dx} = \frac{d(\frac{\sin x}{\cos x})}{dx} = \sec^2 x$$

$$4. \frac{d(\cot x)}{dx} = \frac{d(\frac{\cos x}{\sin x})}{dx} = -\csc^2 x$$

$$5. \frac{d(\sec x)}{dx} = \frac{d(\frac{1}{\cos x})}{dx} = \sec x \tan x$$

$$6. \frac{d(\csc x)}{dx} = \frac{d(\frac{1}{\sin x})}{dx} = -\csc x \cot x$$

$$y = \tan x = \frac{\sin x}{\cos x} \rightarrow y' = ?$$

$$g(x) = \sin x \rightarrow g'(x) = \cos x$$

$$h(x) = \cos x \rightarrow h'(x) = -\sin x$$

$$y' = \frac{g'(x)h(x) - h'(x)g(x)}{[h(x)]^2}$$

$$= \frac{\cos x \cdot \cos x - (-\sin x) \sin x}{\cos^2 x} = \frac{\cos^2 x + \sin^2 x}{\cos^2 x}$$

$$= \frac{1}{\cos^2 x} = \sec^2 x \quad \left( \sec x = \frac{1}{\cos x} \right)$$

Contoh

$$f(x) = \frac{1 - \sin x}{\cos x}$$

$$g(x) \rightarrow g'(x) = -\cos x$$

$$h(x) \rightarrow h'(x) = -\sin x$$

$$f'(x) = \frac{g'(x)h(x) - h'(x)g(x)}{[h(x)]^2}$$

$$= \frac{-\cos x \cdot \cos x - (-\sin x)(1 - \sin x)}{\cos^2 x}$$

$$= \frac{-\cos^2 x + \sin x - \sin^2 x}{\cos^2 x}$$

$$= \frac{\sin x - 1}{\cos^2 x}$$

$$f'(x) = \frac{\sin x - 1}{\cos^2 x}$$