



LEMBAR KERJA PESERTA DIDIK

Turunan fungsi tangen, kotangen, secan dan kosecan

Nama Anggota Kelompok :

- 1.
- 2.
- 3.
- 4.

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Indikator Ketercapaian Kompetensi

- 1. Memahami Turunan Fungsi Tangen, Kotangen, Secan dan Kosecan**
- 2. Menyelesaikan soal Turunan Fungsi Fungsi Tangen, Kotangen, Secan dan Kosecan**

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A. Turunan Fungsi Tangen

$$y = f(x) = \tan x = \frac{\sin x}{\cos x} \text{ dengan } x \text{ dalam radian}$$

$$u = \sin x \Rightarrow u' = \dots\dots\dots$$

$$v = \cos x \Rightarrow v' = \dots\dots\dots$$

Maka :

$$\begin{aligned} y' &= \frac{u'v - uv'}{v^2} = \frac{(\dots\dots\dots)(\dots\dots\dots) - (\dots\dots\dots)(\dots\dots\dots)}{(\dots\dots\dots)^2} \\ &= \frac{(\dots\dots\dots)^2 + (\dots\dots\dots)^2}{(\dots\dots\dots)^2} = \frac{\dots\dots\dots}{(\dots\dots\dots)^2} = \left(\frac{\dots\dots\dots}{\dots\dots\dots} \right)^2 \end{aligned}$$

$$y' = (\dots\dots\dots)^2 = \dots\dots\dots^2 x$$

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B. Turunan Fungsi Kotangen

$$y = f(x) = \cot x = \frac{\cos x}{\sin x} \text{ dengan } x \text{ dalam radian}$$

$$u = \cos x \Rightarrow u' = \dots\dots\dots$$

$$v = \sin x \Rightarrow v' = \dots\dots\dots$$

Maka :

$$\begin{aligned} y' &= \frac{u'v - uv'}{v^2} = \frac{(\dots\dots\dots)(\dots\dots\dots) - (\dots\dots\dots)(\dots\dots\dots)}{(\dots\dots\dots)^2} \\ &= \frac{-(\dots\dots\dots)^2 - (\dots\dots\dots)^2}{(\dots\dots\dots)^2} = -\frac{\dots\dots\dots}{(\dots\dots\dots)^2} = -\left(\frac{\dots\dots\dots}{\dots\dots\dots}\right)^2 \end{aligned}$$

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$$y' = -(\dots\dots\dots)^2 = -\dots\dots\dots^2 x$$

c. Turunan Fungsi Secan

$$y = f(x) = \sec x = \frac{1}{\cos x} \text{ dengan } x \text{ dalam radian}$$

$$u = 1 \Rightarrow u' = \dots$$

$$v = \cos x \Rightarrow v' = \dots$$

Maka :

$$y' = \frac{u'v - uv'}{v^2} = \frac{(\dots) \cdot (\dots) - (\dots)(\dots)}{\dots^2 x}$$

$$= \frac{\dots}{\dots^2 x} = \frac{\dots}{\dots} \left(\frac{1}{\dots} \right)$$

$$y' = \dots \cdot \dots$$

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D. Turunan Fungsi Kosecan

$$y = f(x) = \operatorname{cosec} x = \frac{1}{\sin x} \text{ dengan } x \text{ dalam radian}$$

$$u = 1 \Rightarrow u' = \dots\dots$$

$$v = \sin x \Rightarrow v' = \dots\dots\dots$$

Maka :

$$y' = \frac{u'v - uv'}{v^2} = \frac{(\dots) \cdot (\dots\dots\dots) - (\dots)(\dots\dots\dots)}{\dots\dots\dots^2 x}$$

$$= -\frac{\dots\dots\dots}{\dots\dots\dots^2 x} = -\frac{\dots\dots\dots}{\dots\dots\dots} \left(\frac{1}{\dots\dots\dots} \right)$$

$$y' = -\dots\dots\dots \cdot \dots\dots\dots$$

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LATIHAN

1. Tentukan turunan dari :

a. $y = \tan x - \cot x$

b. $f(t) = \sec t - \operatorname{cosec} 3t$

2. Jika $f(x) = \tan x - \cot x$ maka tentukan $f'(45^\circ)$

Jawaban

1. a. $y = \tan x - \cot x$

b. $f(t) = \sec t - \operatorname{cosec} t$

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