

NAMA : DHEA SHEILA NABILASARI

KELAS : XII MIPA 6

TUGAS : MATEMATIKA PEMINATAN 1

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1) Hitung $\lim_{x \rightarrow 0} \frac{\sin 4x}{\tan 5x} =$

Penyelesaian

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{\sin 4x}{\tan 5x} &= \lim_{x \rightarrow 0} \frac{\frac{d}{dx} (\sin 4x)}{\frac{d}{dx} (\tan 5x)} \\ &= \lim_{x \rightarrow 0} \frac{4 \cos 4x}{5 \sec^2 5x} \\ &= \frac{4 \cos (4 \cdot 0)}{5 \cdot \sec^2 (5 \cdot 0)} \\ &= \frac{4 \cos 0}{5 \sec^2 0} \\ &= \frac{4 \cdot 1}{5 \cdot 1} \\ &= \frac{4}{5} // \end{aligned}$$

2) Hitung $\lim_{x \rightarrow 0} \frac{\sin 7x}{3x - \tan 2x} =$

Penyelesaian :

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{\sin 7x}{3x - \tan 2x} &= \lim_{x \rightarrow 0} \frac{7 \cos 7x}{3 - 2 \sec^2 2x} \\ &= \frac{7 \cos (7 \cdot 0)}{3 - 2 \sec^2 (2 \cdot 0)} = \frac{7 \cdot 1}{3 - 2 \cdot 1} \\ &= \frac{7}{1} = 7 // \end{aligned}$$

3) Nilai $\lim_{x \rightarrow 0} \frac{\sin 4x + \sin 6x}{\sin 2x}$

Pengelasan :

$$\lim_{x \rightarrow 0} \frac{\sin 4x + \sin 6x}{\sin 2x} = \lim_{x \rightarrow 0} \frac{\sin 4x}{\sin 2x} + \frac{\sin 6x}{\sin 2x}$$

$$= \frac{4}{2} + \frac{6}{2}$$

$$= 2 + 3$$

$$= 5 //$$

4) Nilai $\lim_{x \rightarrow 1} \frac{(x^2-1) \sin(x-1)}{2 \sin^2(x-1)}$

Pengelasan :

$$\lim_{x \rightarrow 1} \frac{(x^2-1) \sin 2(x-1)}{2 \sin^2(x-1)} = \lim_{x \rightarrow 1} \frac{(x-1)(x+1) \sin 2(x-1)}{2 \sin(x-1) \sin(x-1)}$$

$$= \lim_{x \rightarrow 1} \frac{(x+1) \cdot \cancel{(x-1)} \cdot \sin 2(x-1)}{2 \sin(x-1) \cancel{\sin(x-1)}}$$

$$= \frac{(1+1) \cdot 1 \cdot 2}{2}$$

$$= 1 \cdot 1 \cdot 2$$

$$= 2 //$$

5) Misal: $\lim_{x \rightarrow 5} (\pi - 2x) \tan x$ adalah

Penyelesaian:

$$\lim_{x \rightarrow 5} (\pi - 2x) \tan x \Rightarrow \lim_{x \rightarrow \frac{\pi}{2}} -2 \left(x - \frac{\pi}{2}\right) \tan x$$

Bisa diubah menjadi $x \rightarrow \frac{\pi}{2}$

$$\lim_{x \rightarrow \frac{\pi}{2}} -2 \left(x - \frac{\pi}{2}\right) \tan x = \lim_{x \rightarrow \frac{\pi}{2}} -2 \left(x - \frac{\pi}{2}\right) \frac{\sin x}{\cos x}$$

$$= \lim_{x \rightarrow \frac{\pi}{2}} -2 \left(x - \frac{\pi}{2}\right) \frac{\sin x}{-\sin \left(x - \frac{\pi}{2}\right)}$$

$$= \lim_{x \rightarrow \frac{\pi}{2}} \left[\frac{-2}{-1} \cdot \sin x \right]$$

$$= 2 \sin \frac{\pi}{2}$$

$$* = 2 \sin \frac{180}{2}$$

$$= 2 \sin 90$$

$$= 2 \cdot 1 = 2 //$$