

Jawaban:

10.

$$1) \lim_{x \rightarrow 0} \frac{\sin 4x}{\tan(-5x)}$$

$$\lim_{x \rightarrow 0} \frac{\frac{d}{dx} (\sin 4x)}{\frac{d}{dx} (\tan(-5x))}$$

$$= \lim_{x \rightarrow 0} \frac{4 \cos(4x)}{-5 \sec^2(-5x)}$$

$$= \frac{4 \cos(4 \cdot 0)}{-5 \sec^2(-5 \cdot 0)}$$

$$= \frac{4 \cdot \cos(0)}{-5 \sec^2(0)} = \frac{4 \cdot 1}{-5 \cdot 1} = -\frac{4}{5}$$

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

$$= \frac{7 \cdot \cos 0}{3 - 2 \cdot \sec^2 0} = \frac{7 \cdot 1}{3 - 2 \cdot 1} = \frac{7}{3-2}$$

$$= 7$$

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

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

$$= 2 + 3 = 5$$

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

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

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

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

$$5) \lim_{x \rightarrow \frac{\pi}{2}} (\pi - 2x) \tan x =$$

dgn sub
 misal $x - \frac{\pi}{2} = y \rightarrow x = \frac{\pi}{2} + y$

$$2x = \pi + 2y$$

$$x = \frac{\pi}{2} \rightarrow y = 0$$

$$\lim_{x \rightarrow \frac{\pi}{2}} (\pi - 2x) \tan x$$

$$= \lim_{y \rightarrow 0} (\pi - (\pi + 2y)) \tan(\frac{\pi}{2} + y)$$

$$\lim_{y \rightarrow 0} (-2y) (-\cot y) = \lim_{y \rightarrow 0} \frac{(-2y)}{-\tan y} = \frac{-2y}{-y} = 2$$