

Tugas 7 Limit & Kontinu

No.

Date.

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1. $f(x) = \begin{cases} x^2 + 1 & x \leq 1 \\ x^2 - x + 2 & x > 1 \end{cases}$ hitung $\lim_{x \rightarrow 1^-}$ dan $\lim_{x \rightarrow 1^+}$

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$$\lim_{x \rightarrow 1^-} x^2 + 1 = 1 + 1 = 2$$

$$\lim_{x \rightarrow 1^+} x^2 - x + 2 = 1 - 1 + 2 = 2$$

$\therefore \lim_{x \rightarrow 1^-} = \lim_{x \rightarrow 1^+}$, maka kontinu

di $x = 1$,

$$\lim_{x \rightarrow 0} \frac{\tan x}{\sin 2x} = \frac{\lim_{x \rightarrow 0} \frac{\tan x}{x} \cdot 1}{\lim_{x \rightarrow 0} \frac{\sin 2x}{2x} \cdot 2} = \frac{1}{2}$$

3. $f(x) = \begin{cases} x^2 - 1 & x \leq -1 \\ 2x + 2 & x > -1 \end{cases}$

apakah kontinu di $x = -1$?

$$\lim_{x \rightarrow -1^-} x^2 - 1 = 1 - 1 = 0$$

$$\lim_{x \rightarrow -1^+} 2x + 2 = -2 + 2 = 0$$

$\therefore \lim_{x \rightarrow -1^-} = \lim_{x \rightarrow -1^+}$, maka kontinu

di $x = -1$

6. $\lim_{x \rightarrow \infty} \frac{x}{1+x^2} = \lim_{x \rightarrow \infty} \frac{x^2(1/x)}{x^2(1/x^2+1)} = \frac{0}{0+1} = 0$

7. $\lim_{x \rightarrow \infty} \frac{x^2+x}{x+1} = \lim_{x \rightarrow \infty} \frac{x(x+1)}{x(1+1/x)} = \frac{\infty}{1} = \infty$

8. $\lim_{x \rightarrow \infty} (\sqrt{x-1} - \sqrt{x})$

$$= \lim_{x \rightarrow \infty} \left[(\sqrt{x-1} - \sqrt{x}) \cdot \frac{(\sqrt{x-1} + \sqrt{x})}{(\sqrt{x-1} + \sqrt{x})} \right]$$

$$= \lim_{x \rightarrow \infty} \frac{x-1-x}{(\sqrt{x-1} + \sqrt{x})} = \lim_{x \rightarrow \infty} \frac{-1}{\sqrt{x-1} + \sqrt{x}} = 0$$

$$\lim_{x \rightarrow \infty} \frac{\sqrt{x} \cdot \frac{1}{\sqrt{x}}}{\sqrt{x}(\sqrt{1-\frac{1}{x}}+1)}$$

$$= \frac{-1/0}{\sqrt{1-0}+1} = 0$$

$$1 + \frac{1}{x} = \frac{x+1}{x}$$

$$1 + \frac{1}{x} = \frac{x+1}{x}$$

$$\frac{1}{x} = \frac{1}{x}$$

$$(2-x) = y$$

$$2 - (2-x) = x$$

$$(2-x) = 0$$

$$x^2 \cdot \frac{1}{x} = x$$

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