Nama : Johanes Yogtan WR
Nim : 215314105

kuis 1

① $\lim\limits_{h \to 0} \dfrac{(a+h)^3 - a}{2h}$ → Penyederhanaan

$= \dfrac{(a+h)^3 - a^3}{2h}$

$= \dfrac{1}{2}(h^2 + 3ah + 3a^2)$

$= \lim\limits_{h \to 0} \left(\dfrac{1}{2}(h^2 + 3ah + 3a^2) \right)$

$= \dfrac{1}{2}(0^2 + 3a \cdot 0 + 3a^2)$ → $h = 0$

$= \dfrac{3a^2}{2}$ //

② $\lim\limits_{x \to \infty} \left(\sqrt{4x^2 + x} - 2x \right)$

$= \sqrt{4x^2 + x} - 2$

$= \dfrac{x}{\sqrt{4x^2 + x} + 2x}$ → Gonugate Radical

$= \lim\limits_{x \to \infty} \left(\dfrac{x}{\sqrt{4x^2 + x} + 2x} \right)$

$= \dfrac{1}{\sqrt{4 + \frac{1}{x}} + 2}$ → membagi penyebut tertinggi

$= \lim\limits_{x \to \infty} \left(\dfrac{1}{\sqrt{4 + \frac{1}{x}} + 2} \right)$

$= \dfrac{\lim\limits_{x \to \infty}(1)}{\lim\limits_{x \to \infty}\left(\sqrt{4 + \frac{1}{x}} + 2\right)}$

$= \lim\limits_{x \to \infty}(1) = 1$

$= \lim\limits_{x \to \infty}\left(\sqrt{4 + \frac{1}{x}} + 2 \right) = 4$ ⟩ Jadi limitnya $\dfrac{1}{4}$ =

③ Garis tangen titik $(2,2)$

$$y = \sqrt{x+2}$$

$$M_{tan} = \lim_{h \to 0} \frac{F(x+h) - F(x)}{h}$$

$$= \lim_{h \to 0} \frac{[\sqrt{(x+h)+2}] - \sqrt{x+2}}{h}$$

$$= \lim_{h \to 0} \frac{\sqrt{x+h+\cancel{2}} - \sqrt{x-\cancel{2}}}{h}$$

$$= \lim_{h \to 0} \frac{\sqrt{x+\cancel{h}} - \sqrt{x}}{\cancel{h}}$$

$$= \lim_{h \to 0} \sqrt{x} - \sqrt{x}$$

$$= \sqrt{x} - \sqrt{x}$$

$$= \sqrt{2} - \sqrt{2}$$

$$= 0 /\!/$$

.

④ Gradien fungsi y, Pada $x = 1$

$$y = \sqrt{\frac{x}{x+2}}$$

$$M_{sec} = \frac{F(1+h) - F(1)}{h}$$

$$= \frac{\sqrt{\frac{1}{\cancel{\oplus}1+h+2}} - \sqrt{\frac{1}{1+2}}}{h}$$

$$= \frac{\sqrt{\frac{1}{3h}} - \sqrt{\frac{1}{3}}}{h}$$

$$= \frac{\sqrt{2 - (2+h)}}{(3+h)(3)(h)}$$

$$= \frac{\sqrt{-h}}{(3+h)(3)(h)}$$

$$= -\frac{1}{3h+9} /\!/$$