

Kalkulus Bab 7

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Cariilah $\frac{dy}{dx}$ dari $y = x^3$

$$\begin{aligned}
 y' &= \frac{dy}{dx} = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \\
 &= \lim_{h \rightarrow 0} \frac{(x+h)^3 - x^3}{h} \\
 &= \lim_{h \rightarrow 0} \frac{(x^3 + 3x^2h + 3xh^2 + h^3) - x^3}{h} \\
 &= \lim_{h \rightarrow 0} \frac{h(3x^2 + 3xh + h^2)}{h} \\
 &= \lim_{h \rightarrow 0} 3x^2
 \end{aligned}$$

Cariilah $\frac{dy}{dx}$ dari $y = \frac{1}{x}$

$$\begin{aligned}
 y' &= \frac{dy}{dx} = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h} \\
 &= \cancel{\lim_{h \rightarrow 0} \frac{(x+h)^{-1} - x^{-1}}{h}} = \lim_{h \rightarrow 0} \frac{(x+h)^{-1} - x^{-1}}{h} \\
 &= \cancel{\lim_{h \rightarrow 0} \frac{1}{(x+h)x} \cdot \cancel{x}} = \lim_{h \rightarrow 0} -\frac{1}{x^2} = -\frac{1}{x^2}
 \end{aligned}$$

$$\begin{aligned}
 \text{Dik. } y &= \left(\frac{2x-3}{3x+1} \right)^7 & y' &= \frac{2(3x+1)-(2x-3)3}{(3x+1)^2} \\
 y' &= 7 \left(\frac{2x-3}{3x+1} \right)^6 \cdot \frac{d}{dx} \left(\frac{2x-3}{3x+1} \right) & & \cdot \frac{11}{(3x+1)^2} \\
 &= 7 \left(\frac{2x-3}{3x+1} \right)^6 \cdot \frac{11}{(3x+1)^2} \\
 y' &= 77 \left(\frac{2x-3}{3x+1} \right)^6
 \end{aligned}$$

No.

Date

Soal turunan rantai

① $y = \sin(x^3)$

$$y' = 3x^2 \cdot \cos x^3$$

② $y = \sin^3 x$

$$y' = 3\sin^2 x \cdot \cos x$$

③ $y = \tan(x^2 + 4x)$

$$y' = (2x + 4) \sec^2(x^2 + 4x)$$

④ $y = \cos(x^2 - 7x)^6$

$$y' = -6(2x - 7)(x^2 - 7x)^5 \sin(x^2 - 7x)^6$$

⑤ $y = \cos^6(x^2 - 7x)$

$$y' = -6(2x - 7) \cos^5(x^2 - 7x) \sin(x^2 - 7x)$$