

ตอนที่ 2 จงแสดงวิธีทำลงในกระดาษเขียนตอบ

1. จงหาค่าของ $\lim_{x \rightarrow 1} \frac{x-1}{\sqrt{x^2+3}-2}$ (ใช้คอนจูเกตมาช่วย)

$$\lim_{x \rightarrow 1} \frac{x-1}{\sqrt{x^2+3}-2} =$$

$$\begin{aligned}
 &= \lim_{x \rightarrow 1} \frac{x(\sqrt{x^2+3}+2) - (\sqrt{x^2+3}+2)}{(x-1)(x+1)} = \frac{(\sqrt{4}+2)}{(1+1)} = \lim_{x \rightarrow 1} \frac{(x\sqrt{x^2+3}+2x) - (\sqrt{x^2+3}+2)}{x^2-1} \\
 &= \lim_{x \rightarrow 1} \frac{(\sqrt{x^2+3}+2)}{(x+1)} \quad \lim_{x \rightarrow 1} \frac{x-1}{\sqrt{x^2+3}-2} * \frac{\sqrt{x^2+3}+2}{\sqrt{x^2+3}+2} = \lim_{x \rightarrow 1} \frac{(x-1)(\sqrt{x^2+3}+2)}{(x-1)(x+1)} \\
 &= \frac{(2+2)}{(1+1)} = 2 \\
 &= \frac{(\sqrt{1^2+3}+2)}{(1+1)} = \lim_{x \rightarrow 1} \frac{x\sqrt{x^2+3}+2x - \sqrt{x^2+3}-2}{x^2+3-4} = \frac{(4)}{(2)}
 \end{aligned}$$

2. กำหนดให้ $y = \left[\frac{2x+1}{1-2x} \right]^3$ จงหา $\frac{dy}{dx}$
ให้ จะได้

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$$\begin{aligned} & \frac{2x+1}{1-2x} \quad u^3 \quad \frac{du^3}{du} \cdot \frac{d\frac{2x+1}{1-2x}}{dx} \quad 3u^2 \cdot \frac{(1-2x) \frac{d(2x+1)}{dx} - (2x+1) \frac{d(1-2x)}{dx}}{(1-2x)^2} \\ & 3u^2 \cdot \frac{(1-2x)2 - ((2x+1)(-2))}{(1-2x)^2} \quad 3u^2 \cdot \frac{(2-4x) - (-4x-2)}{(1-2x)^2} \\ & 3u^2 \cdot \frac{2-4x+4x+2}{(1-2x)^2} \quad 3\left(\frac{2x+1}{1-2x}\right)^2 \cdot \frac{4}{(1-2x)^2} \quad \left(\frac{2x+1}{1-2x}\right)^2 \cdot \frac{12}{(1-2x)^2} \end{aligned}$$