

2.4 Chain Rule

$$\frac{d}{dx} [f(g(x))] = f'(g(x)) \cdot g'(x)$$

2 1) $f(x) = \sin(x^2 - 4)$

$$f'(x) = \cos(x^2 - 4) \cdot 2x$$

$$f'(x) = 2x \cos(x^2 - 4)$$

7* 2) $f(x) = \cos^2 3x \rightarrow (\cos 3x)^2$

$$f'(x) = 2(\cos 3x) \cdot -\sin 3x \cdot 3$$

$$f'(x) = -6 \cos 3x \sin 3x$$

3 3) $Q(x) = \sqrt[4]{5x+3} \rightarrow (5x+3)^{1/4}$

$$Q'(x) = \frac{1}{4} (5x+3)^{-3/4} \cdot 5$$

$$Q'(x) = \frac{5}{4} (5x+3)^{-3/4}$$

YT 1 4) $y = \sin(\pi x)$

$$y' = \cos(\pi x) \cdot \pi$$

$$y' = \pi \cos(\pi x)$$

1 5) $y = (4 - x^2)^5$

$$y' = 5(4 - x^2)^4 \cdot -2x$$

$$y' = -10x(4 - x^2)^4$$