

Calculus I

Trig functions with power notation and the chain rule

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$$(g(h(x)))' = g'(h(x)) \cdot h'(x) \quad (\text{notation 1})$$

$$(g(u))' = g'(u)u' \quad \text{where } u = h(x) \quad (\text{notation 2})$$

$$\frac{dy}{dx} = \frac{dy}{du} \frac{du}{dx} \quad \text{where } y = g(u) \quad (\text{notation 3}) \quad .$$

Example (Chain Rule, Notation 2)

$$\text{Differentiate } f(x) = \cos(x^3) .$$

$$\text{Let } u =$$

$$\text{Let } g(u) =$$

$$\text{Then } f(x) = g(u) .$$

$$\text{Chain Rule: } f'(x) = g'(u)u'$$

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