

Calculus I

Miscellaneous chain rule problems, part 1

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2019

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

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

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

Example (Chain Rule, Notation 1, square root of a trigonometric function)

$$\text{Differentiate } f(x) = \sqrt{\sin x + 2}.$$

$$\text{Let } h(x)$$

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

$$\begin{aligned} \text{Chain Rule: } f'(x) &= g'(h(x))h'(x) \\ &= \left(\quad \right) \left(\quad \right) \end{aligned}$$