Calculus 1 Workbook

Chain rule

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MATH

CHAIN RULE WITH POWER RULE

■ 1. Find $h'(x)$ if $h(x) = (3x^2 - 7)^4$.

■ 2. Find $h'(x)$ if $h(x) = \sqrt{2 - 4x^2}$.

■ 3. Find $h'(x)$ if $h(x) = (2x^2 - 6x + 5)^7$.

■ 4. Find $h'(x)$ if $h(x) = 2(x^3 + 4x^2 - 2x)^{-5}$.

■ 5. Find $f'(x)$ if $f(x) = 3(5x^2 + \sin x)^4$.

■ 6. Find $g'(y)$ if $g(y) = \sqrt{3y + (2y + y^2)^2}$.

CHAIN RULE WITH TRIG, LOG, AND EXPONENTIAL FUNCTIONS

■ **1. Find** $f'(x)$.

$$f(x) = \ln(x^2 + 6x + 9)$$

■ **2. Find** $g'(x)$ **if** $g(x) = 3\sin(4x^3) - 4\cos(6x) + 3\sec(2x^4)$.

■ **3. Find** $h'(x)$ **if** $h(x) = \cos(\sin x + 3x^3)$.

■ **4. Find** $f'(y)$ **if** $f(y) = e^{y + \ln y} + 8^{\cos y}$.

■ **5. Find** $f'(x)$ **if** $f(x) = \tan^5 x + \tan x^5$.

■ **6. Find** $g'(x)$ **if** $g(x) = \ln(e^{\sin x} - \sin^2 x)$.

CHAIN RULE WITH PRODUCT RULE

■ 1. Find $y'(x)$ if $y(x) = (3x - 2)(5x^3)^5$.

■ 2. Find $h'(x)$ if $h(x) = (x^2 - 5x)^2(2x^3 - 3x^2)^5$.

■ 3. Find the derivative of the function.

$$y = (\sin(7x))(7e^{4x})(2x^6 + 1)$$

■ 4. Find $h'(x)$ if $h(x) = \sin(4x)e^{3x^2+4}$.

■ 5. Find the derivative of the function.

$$y = \sin(x^2 e^{x^2})$$

■ 6. Find $h'(x)$ if $h(x) = \ln(x^3\sqrt{3x^4 - 2x^2 + 3})$.

CHAIN RULE WITH QUOTIENT RULE

■ 1. Find $h'(x)$.

$$h(x) = \frac{(2x + 1)^3}{(3x - 2)^2}$$

■ 2. Find $h'(x)$.

$$h(x) = \frac{(4x + 5)^5}{(x + 3)^2}$$

■ 3. Find $h'(x)$.

$$h(x) = \ln\left(\frac{x^3}{x^2 + 3}\right)$$

■ 4. Find $h'(x)$.

$$h(x) = \frac{\sec(2 - x)}{2x + e^{-x}}$$

■ 5. Find $h'(x)$.

$$h(x) = \frac{2 + \ln(3x)}{x + \cot(2x)}$$

■ 6. Find $h'(x)$.

$$h(x) = x^2 \sin\left(\frac{x^3 + 4x}{\sqrt{x^4 - 2}}\right)$$