

Name: Key

Chain Rule Practice

Find the derivative of each function. Write which rule you used (power rule, product rule, quotient rule and/or chain rule) for each problem.

1) $y = 3x^2 - 5x + 6$

$6x - 5$
Power

2) $f(x) = (-x^3 + 2)(2x - 1)$

$(-3x^2)(2x - 1) + (-x^3 + 2)(2)$

$-6x^3 + 3x^2 - 2x^3 + 4$

$-8x^3 + 3x^2 + 4$

Product

3) $h(x) = \frac{6x+7}{x^2+1}$

$\frac{6(x^2+1) - [2x(6x+7)]}{(x^2+1)^2}$

$\frac{-6x^2 - 14x + 6}{(x^2+1)^2}$ Quotient

4) $p(x) = 2(2x - 7)^3$

$6(2x-7)^2 [2]$

$12(2x-7)^2$

chain

5) $f(x) = \sqrt[3]{6x^2+1}$

$(6x^2+1)^{1/3}$

$\frac{1}{3}(6x^2+1)^{-2/3} [12x]$

$\frac{12x}{3\sqrt[3]{(6x^2+1)^2}}$

$\frac{4x}{\sqrt[3]{(6x^2+1)^2}}$

chain

6) $r(x) = \sqrt{x^2 - 4x + 2}$

$(x^2 - 4x + 2)^{1/2}$

$\frac{1}{2}(x^2 - 4x + 2)^{-1/2} [2x - 4]$

$\frac{x-2}{\sqrt{x^2-4x+2}}$ chain

7) $h(t) = -\frac{3}{(t-2)^4}$

$-3(t-2)^{-4}$

$12(t-2)^{-5} [1]$

$\frac{12}{(t-2)^5}$

chain

8) $m(x) = x(2x-5)^3$

$1(2x-5)^3 + (x)[3(2x-5)^2 [2]]$

$(2x-5)^3 + 6x(2x-5)^2$

Product w/ chain!

9) $g(x) = \left(\frac{3x^2-2}{2x+3}\right)^3$ Chain + Quotient

$3\left(\frac{3x^2-2}{2x+3}\right)^2 \left[\frac{6x(2x+3) - [2(3x^2-2)]}{(2x+3)^2}\right]$

$\frac{3[3x^2-2]^2 [12x^2+18x-6x^2+4]}{(2x+3)^4}$

$\frac{[3x^2-2]^2 (36x^2+54x-18x^2+12)}{(2x+3)^4}$

$\frac{(3x^2-2)^2 (18x^2+54x+12)}{(2x+3)^4}$