

Math 220 – Business Calculus
Spring 2013 Quiz 3
Power, Product, Quotient, Chain Rules

Find the derivative of each function

5 1. $f(x) = 3x^4 + \sqrt[5]{x} - \frac{2}{x^3} + \log_2 x + 6^x$
 $(3)(4)x^3 + \frac{1}{5}x^{-4/5} + \frac{6}{x^4} + \frac{1}{x \ln 2} + 6^x \ln 6$

4 2. $h(y) = (3y^4 - 5y^3 + 8)(4y^2 + 6y - 5)$
 $(12y^3 - 15y^2 + 8)(4y^2 + 6y - 5) + (12y^3 - 15y^2)(4y^2 + 6y - 5)$

4 3. $g(x) = \frac{(43)}{2x^3+4} (43)(-1)(2x^3+4)^{-2} (6x^2)$

3 4. $\sqrt[3]{e^{x^2-4x+8}} \frac{1}{3}(e^{x^2-4x+8})^{-2/3} (e^{x^2-4x+8})(2x-4)$

4 5. Find the equation of the tangent to $f(x) = \frac{8}{\sqrt{3x+1}}$ at $x = 1$.

Hint: slope = $f'(1)$

(Find $f'(x)$, evaluate at $x=1$)

$$f'(x) = (8)\left(-\frac{1}{2}\right)(3x+1)^{-3/2} (3) = \frac{-12}{\sqrt{(3x+1)^3}}$$

$$f'(1) = \frac{-12}{\sqrt{4^3}} = -\frac{12}{8} = -\frac{3}{2}$$

$$f(1) = \frac{8}{\sqrt{4}} = 4$$

$$(y - 4) = -\frac{3}{2}(x - 1)$$