

MATH 2200 - DIFFERENTIAL CALCULUS, Fall, 2005

QUIZ 1 9/23/05

Name : SOLUTIONS

Find the derivative of the following functions:

1.

$$f(x) = (1 - 2\sqrt{x} - 3x)(x^{10} + 5x^5 + 10x)$$

Apply product rule!

$$\begin{aligned} f'(x) &= \left(-2\frac{1}{2}x^{-\frac{1}{2}} - 3\right)(x^{10} + 5x^5 + 10x) + (1 - 2\sqrt{x} - 3x)(10x^9 + 25x^4 + 10) \\ &= -\left(\frac{1}{\sqrt{x}} + 3\right)(x^{10} + 5x^5 + 10x) + (1 - 2\sqrt{x} - 3x)(10x^9 + 25x^4 + 10) \end{aligned}$$

2.

$$f(x) = \frac{x^2}{x-4}$$

Apply quotient rule

$$\begin{aligned} f'(x) &= \frac{2x(x-4) - x^2(1)}{(x-4)^2} \\ &= \frac{2x^2 - 8x - x^2}{(x-4)^2} \\ &= \frac{x(x-8)}{(x-4)^2} \end{aligned}$$