

Math 171 - Quiz 7

October 9, 2013

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (6 points) Find the derivative of each function.

(a) $f(x) = (x^2 + 6x + 8)^4$

$$f'(x) = 4(x^2 + 6x + 8)^3 (2x + 6)$$

(b) $g(x) = \frac{2}{\sqrt{5x+3}} = 2(5x+3)^{-1/2}$

$$g'(x) = 2\left(-\frac{1}{2}\right)(5x+3)^{-3/2}(5)$$

(c) $s(t) = (t^2 + 1)(t^3 + 1)^7$

$$s'(t) = (2t)(t^3+1)^7 + (t^2+1)(7)(t^3+1)^6(3t^2)$$

2. (4 points) Find the slope of the line tangent to the graph of the following equation at the point (1, 2).

$x^2 + 5xy - y^3 = 3$

$$\frac{d}{dx}(x^2 + 5xy - y^3) = \frac{d}{dx}(3)$$

$$2x + 5y + 5x \frac{dy}{dx} - 3y^2 \frac{dy}{dx} = 0$$

$$(5x - 3y^2) \frac{dy}{dx} = -2x - 5y$$

$$\frac{dy}{dx} = \frac{-2x - 5y}{5x - 3y^2}$$

$$\left. \frac{dy}{dx} \right|_{(1,2)} = \frac{-12}{-7} = \boxed{\frac{12}{7}}$$