

MATH 1850 Sec 001
SINGLE VARIABLE CALCULUS I
QUIZ 4
February 14, 2013

Name (Last, First) Key

1. Find the derivative of the following function.

$$f(x) = \frac{8x-3}{9x+4}$$

$$f'(x) = \frac{(9x+4) \frac{d}{dx}(8x-3) - (8x-3) \frac{d}{dx}(9x+4)}{(9x+4)^2}$$

$$= \frac{(9x+4) \cdot 8 - (8x-3) \cdot 9}{(9x+4)^2}$$

$$= \frac{\cancel{72x} + 32 - \cancel{72x} + 27}{(9x+4)^2} = \boxed{\frac{59}{(9x+4)^2}}$$

2. Find $\frac{dy}{dx}$ for

$$y = 9x^2 \sin x + 18x \cos x - 18 \sin x$$

$$\frac{dy}{dx} = 9 \left(x^2 \frac{d}{dx}(\sin x) + \sin x \frac{d}{dx}(x^2) \right) + 18 \left(x \frac{d}{dx}(\cos x) + \cos x \frac{d}{dx}(x) \right) - 18 \frac{d}{dx}(\sin x)$$

$$= 9x^2 \cos x + \cancel{18x \sin x} - \cancel{18x \sin x} + \cancel{18 \cos x} - \cancel{18 \cos x}$$

$$= \boxed{9x^2 \cos x}$$