MATH 141 (Section 5 & 6) University of South Carolina
Prof. Meade Fall 2013

Quiz 5 Name: _____ Key _____
September 26, 2013 Section: 005 / 006 (circle one)

1. (5 points) Differentiate the function $f(x) = x^3 + 4 + 2e^x$.

$$f'(x) = 3x^2 + 0 + 2e^x$$
$$= 3x^2 + 2e^x$$

2. (5 points) Find an equation for the normal line to the graph of $y = x^{-4} + 3x^{5/2}$ at $(1, 4)$.

$$\frac{dy}{dx} = -4x^{-5} + 3 \cdot \frac{5}{2}x^{3/2} = -4x^{-5} + \frac{15}{2}x^{3/2}.$$

$$m = \frac{-1}{\frac{dy}{dx}\big|_{x=1}} = \frac{-1}{-4 + \frac{15}{2}} = \frac{-1}{7/2} = -\frac{2}{7}$$

$$y = 4 - \frac{2}{7}(x-1)$$
$$= -\frac{2}{7}x + 4 + \frac{2}{7}$$
$$= -\frac{2}{7}x + \frac{30}{7}$$