

Math 157 - Quiz 6

October 8, 2014

Name key

Score _____

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

1. (4 points) Find an equation of the line tangent to the graph of $f(x) = 2x^3 - 2x^2 + 1$ at the point where $x = 1$.

Slope: $f'(x) = 6x^2 - 4x$

$$m = f'(1) = 2$$

Point: $x = 1$

$$y = f(1) = 1$$

$$y - 1 = 2(x - 1)$$

or

$$y = 2x - 1$$

2. (3 points) Let $s(t) = t^2 + 2\ln t$. Find $s''(t)$.

$$s'(t) = 2t + \frac{2}{t} = 2t + 2t^{-1}$$

$$s''(t) = 2 - 2t^{-2}$$

3. (3 points) Find the instantaneous rate of change of $h(t) = \ln(6t + e^t)$ at $t = 0$.

$$h'(t) = \frac{1}{6t + e^t} \cdot (6 + e^t)$$

$$h'(0) = \frac{1}{1} \cdot (6 + 1) = \boxed{7}$$