

Name _____

You must show all of your work to receive credit for a correct answer. You are not allowed to borrow another student's calculator during the quiz.

1. (6 points) Find derivatives of each of the following functions. Be sure to use correct variable names and proper terminology when referring to the derivative.

(a) $y = 3x^6 - 4x^3 + 13x - 94$

(b) $h = 8 \ln(s) - 5e^s + 4^s$

(c) $g(t) = \sqrt[5]{t} + \frac{3}{t^4} + \frac{1}{\sqrt{t}}$

2. (2 points) Find the equation of the line tangent to the graph of $f(x) = x^3 - 4x^2 + 9$ at $x = 2$.

3. (2 points) The Red-Cockaded Woodpecker is a bird which was put on the endangered species list in 1970. Suppose that the population of these birds is approximated by $f(t) = 10000e^{-0.01t}$, where t is measured in years since 1970.

(a) Approximately how many of these woodpeckers are living today, 31 years later?

(b) How quickly is the population decreasing today? Round off your answer to the nearest two decimal places.