

Name: _____

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Instructor: Bueler | Jurkowski | Maxwell

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. Show all work for full credit.

1. [15 points] Compute the derivatives of the following functions. You need not simplify your answers.

a. $f(x) = x^{\frac{3}{2}} + 9 - e^x$

b. $g(w) = 7w - \frac{\pi}{w^2}$

c. $h(x) = \frac{1}{4 - x^2}$

d. $R(s) = (s^2 - 1)e^s$

e. $f(x) = \frac{3 - x^3}{2 + x}$

2. [4 points] Find the equation of the tangent line to the graph of $y = \sqrt{3x}$ at $x = 2$.

3. [6 points] The temperature in $^{\circ}\text{C}$ of coffee in a cup is given by

$$T(t) = 20 + \frac{50}{e^t}.$$

where t is measured in hours.

a. What is the temperature of the coffee at time $t = 0$? Include units in your answer.

b. What is the rate of change of temperature of the coffee at time $t = 0$? Include units in your answer.