

Name _____

- No calculators allowed.
 - Show sufficient work to justify each answer.
 - You have 15 minutes for this quiz.
1. (2 points each) Using Leibniz notation (i.e., $\frac{dy}{dx}$, $\frac{dP}{dt}$, etc.), find derivatives for each of the following functions. Simplify each answer as much as possible.

(a) $w = 4t^7 - \frac{1}{4t^7}$

(b) $H = 4e^r + 7e^\pi - 3\ln 2$

(c) $y = \left(\frac{\sqrt{x}}{\sqrt[3]{x}} \right)^{12}$

2. (2 points) Determine a derivative for the given function. Do not simplify your answer.

$$f(x) = \frac{10x^3 - x + 7}{x^7 + 5}$$

3. (2 points) Find the x -value for each point on the graph of $f(x) = x^3 - 11x + 678$ where the line tangent to the curve has a slope of 4.