

Name _____

- You have 15 minutes
- No calculators
- Show sufficient work

1. (4 points) Find an equation of the line which is tangent to the curve $y = x^3 - x^2 - 6x$ at its positive x -intercept.

2. (2 points each) Using Leibniz notation (i.e., $\frac{dy}{dx}$, $\frac{dP}{dt}$, etc.), find derivatives for each of the following functions. For part (a) simplify your answer.

(a) $w = \left(\frac{\sqrt[6]{x}}{x\sqrt{x}} \right)^{-6}$

$$(b) \ y = 5r^3 e^r + \sin\left(\frac{\pi}{7}\right)$$

$$(c) \ q = \frac{8}{t^4 + 9}$$