

Homework 4

1. Find the $\frac{dy}{dx}$ by implicit differentiation

$$x^4y - 8xy + 3xy^2 = 9$$

2. Find the value of the derivative (if it exists) at the indicated extremum. (If an answer does not exist, enter DNE.)

$$f(x) = -7x\sqrt{x+1}$$

3. $f(x) = \begin{cases} 4 - x^2, & x \leq 0 \\ -2x, & x > 0 \end{cases}$

- (a) Find the critical numbers of f
(b) Find the open intervals on which the function is increasing or decreasing
(c) Apply the First Derivative Test to identify all relative extrema