Math 131 - Quiz 9

April 3, 2023

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (4 points) Recall that a *critical number* of a function f is an interior point (not a boundary point) in the domain of f at which the derivative is zero or not defined. Let $f(x) = \frac{1}{4}x^4 - \frac{1}{3}x^3 - 3x^2$ for $0 \le x \le 4$. Find all critical numbers of f.

2. (3 points) The function f is the same function as in problem #1:

$$f(x) = \frac{1}{4}x^4 - \frac{1}{3}x^3 - 3x^2 \text{ for } 0 \le x \le 4.$$

Use calculus techniques to find the absolute maximum and minimum values of f on $[0, 4]$. (Do not repeat any of the work you did above.)

3. (3 points) Use calculus techniques to find open intervals on which $g(x) = 4x^2 - 7x + 3$ is increasing/decreasing.