

Math 157 - Quiz 10

November 9, 2016

Name key

Score _____

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

1. (5 points) Consider the function $f(x) = 2x^3 - 9x^2 - 60x + 10$ restricted to the domain $[-4, 4]$. Find the absolute (global) extreme values.

CRIT PTS:

$$\begin{aligned} f'(x) &= 6x^2 - 18x - 60 \\ &= 6(x^2 - 3x - 10) \\ &= 6(x-5)(x+2) = 0 \\ \Rightarrow & \text{ } \cancel{x=5}, x=-2 \end{aligned}$$

$$f(-4) = -22$$

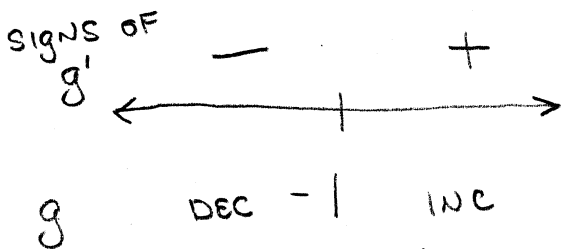
$$f(-2) = 78 \leftarrow \text{ABS MAX}$$

$$f(4) = -246 \leftarrow \text{ABS MIN}$$

END PTS: $x = -4, x = 4$

2. (5 points) Find the absolute (global) minimum value of $g(x) = xe^x$. (Make sure to explain how you know you found an absolute minimum.)

$$\begin{aligned} g'(x) &= xe^x + e^x \\ &= e^x(x+1) = 0 \\ \Rightarrow & x = -1 \end{aligned}$$



g AND g' ARE DEFINED

FOR ALL REAL #'S.

$x = -1$ IS THE ONLY CRIT PT.

g DECREASES UNTIL $x = -1$

AND INCREASES AFTER

$x = -1$.

THERE IS NO
ABS MAX.

$$g(-1) = -1e^{-1} \approx -0.368$$

MUST BE THE
ABS MIN