Math 2A Worksheet: 4.2 Mean Value Theorem

Write your names and Student ID numbers at the top of the page

1. Verify that the function $f(x) = x^3 - 3x + 2$ satisfies the hypotheses of the Mean Value Theorem on $[-2, 2]$. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem

2. Show that $2x + \cos x = 0$ has exactly 1 real root.

3. Let $f(x) = 2 - |2x - 1|$. Show that there is no value of c such that $f(3) - f(0) = f'(c)(3 - 0)$. Why does this not contradict the Mean Value Theorem?

4. Two runners start a race at the same time and finish in a tie. Prove that at some time during the race they have the same speed.