HW QUIZ 7 DUE: MON., NOV. 26 NAME:

Problem 1: (1 point) Use Rolle's Theorem to prove that if f is continuous and differentiable everywhere and has three roots at $x = x_1, x_2, x_3$ then its derivative f' has at least two roots.

Problem 2: (1 point) **Problem 2:** (1 point) Consider $g(x) = \frac{x^4}{2} - x^2$.

(a) (0.5 points) Find the x-values of the critical points of f.

(b) (0.5 points) Use the first derivative test to determine if the critical points are local maximums, minimums or neither.

Problem 3: (1 point) For each of the following, mark the statement as either true (T) or false (F).

(a) (0.25 points) If $f'(x) = 4x^3 + 2x + 4$ then $f(x) = x^4 + x^2 + 4x$. "_____."

(b) (0.25 points) If a function, f, is continuous on $[a, b]$ and differentiable on (a, b) such that $f(a) = f(b) = 0$, then Rolles Theorem can be used to find the x-value, $x = c$, for which $f'(c) = 0$. "_____."

(c) (0.25 points) The first derivative test can be used to determine if a critical point of a differentiable function is a local maximum or minimum. "_____."

(d) (0.25 points) If f is a differentiable function and $f' < 0$ on an interval (x_1, x_2), then we say f is increasing on the interval. "_____."

Problem 4: (2 points) Section 3.1 problems 0,1, 2, 9, 13, 21, 25, 35, 39, 41, 43, 47, 53, 53, 57, 61, 64 and Section 3.2 problems 0, 1, 7, 9, 11, 17, 21, 27, 29, 41, and 31-55 odd.

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DIRECTIONS:

- No papers, phones, calculators, or gadgets are permitted to be out during the quiz.
- Show all work, clearly and in order **You will lose points if any of these instructions are not followed.**
- On a separate piece of paper, complete the list of problems from your textbook listed in Question 4. This list will be graded on completion only. If you do not complete *all* of these problems, you will receive a zero for question 4.

Questions	Points	Score
1	1	
2	1	
3	1	
4	2	
Total	5	