

MATH 170 – Section 004 – Quiz 9

You may work with other class members on this quiz, but you may *not* receive assistance from people not in MATH 170 (Section 004). You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or **YOU WILL GET A ‘ZERO’ ON THE QUIZ**. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by Monday, 7 April 2003 at 11:40 a.m. **GOOD LUCK!**

- 1) Let $f(x) = \cos(x^2 - 1)$ be defined on the interval $[-3, 3]$. Show that the premises of Rolle’s Theorem are satisfied. Then find all numbers c that satisfy the conclusion of Rolle’s Theorem.
- 2) Prove that the equation $\cos x = 2x$ has exactly one solution.
- 3) Let $f(x) = \ln x$ be defined on the interval $[\frac{1}{e}, 1]$. Show that the premises of the Mean Value Theorem are satisfied. Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.
- 4) Suppose $|f'(x)| \leq 3$ for all x . Use the Mean Value Theorem to obtain upper and lower bounds for the expression

$$f(3) - f(-1).$$