

QUIZ #8: CALCULUS 1A (Stankova)

Wednesday, March 17, 2004

Section 10:00–11:00 (Voight)

Name:

Please complete the following problem(s) in the space provided. You may *not* use a calculator. You will have 15 minutes to complete the quiz.

Please include all relevant intermediate calculations and explain your work when appropriate.

Problem 1. *Verify that the function*

$$f(x) = x^3 + 2x - 2$$

satisfies the hypotheses of the Mean Value Theorem on the interval $[0, 1]$.

Then find all numbers c that satisfy the conclusion of the Mean Value Theorem.

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Problem 2. Let $f(x) = x^2/(x - 2)$. Show that there is no value of c such that

$$f(3) - f(1) = f'(c)(3 - 1).$$

Does this contradict the Mean Value Theorem? Why or why not?

QUIZ #8: CALCULUS 1A (Stankova)

Wednesday, March 17, 2004

Section 11:00–12:00 (Voight)

Name:

Please complete the following problem(s) in the space provided. You may *not* use a calculator. You will have 15 minutes to complete the quiz.

Please include all relevant intermediate calculations and explain your work when appropriate.

Problem 1. Let $f(x) = xe^x$.

- (a) *On what intervals is f increasing or decreasing? (Open or closed intervals are acceptable.) Explain your work. [Hint: $e^x > 0$ for all x .]*

- (b) *Find the local maximum and minimum values of f . Explain.*

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(c) *Find the intervals of concavity and the inflection points of f . Explain.*

(d) *Draw the graph of f .*