Name:	Roll Number:

Quiz 03 (Set A)

SIAS, Krea University (AY 2025-26)
Mathematical Methods for Economics (Course Code: **ECON211**)
05 September 2025

Maximum Points: 10 **Duration**: 30 minutes

Dear students,
Instructions and Advice:

- This is a closed book quiz.
- This quiz accounts for 10% of your grades.
- You need to answer 8 questions in all.
- All questions are compulsory. Points for each question are mentioned in parentheses.
- Please select only one choice for the multiple choice questions.
- At no point during the exam, you are allowed to ask clarificatory questions. Make reasonable assumptions if you have doubts and proceed to answer the question.
- You are not permitted to use any electronic device including calculators.
- There is plenty of time. Use it wisely, do not rush.
- All the best!

Multiple Choice Questions

1. (1 point) Consider the following statements:

   Statement (i):

   $\lim_{x \to 0} |x|$ does not exist.

   Statement (ii):

   $f(x) = |x|$ is differentiable at $x = 0$.

   A. Both (i) and (ii) are correct.

   B. Statement (i) is correct but statement (ii) is wrong.

   C. Statement (i) is wrong but statement (ii) is correct.

   D. Both (i) and (ii) are wrong.

   Answer: _____

2. (1 point) If $f(x) = x^2$, $g(x) = x^2 + 1$ and $h(x) = (x + 1)^2$, then

   A. the graph of $g(x)$ can be obtained by shifting $f(x)$ downwards by 1 unit.

   B. the graph of $h(x)$ can be obtained by shifting $f(x)$ upwards by 1 unit.

   C. the graph of $h(x)$ can be obtained by shifting $f(x)$ to the left by 1 unit.

   D. the graph of $g(x)$ can be obtained by shifting $f(x)$ to the right by 1 unit.

   Answer: _____

3. (1 point) Let $f(x) = 2$. Then,

   A. $f^{-1}(x) = 2$

   B. $f^{-1}(x) = \dfrac{1}{2}$

   C. $f^{-1}(x) = \dfrac{1}{2x}$

   D. $f^{-1}(x)$ does not exist.

   Answer: _____

Short Answer Questions-I

4. (1 point) Calculate: $\lim_{x\to\infty} \dfrac{x^3 - 68x^2 + 20}{4x^3 - 2x^2 + 1009}$.

5. (1 point) Compute $\dfrac{dy}{dx}$ if $y = 2x + \dfrac{1}{\sqrt{x}}$.

6. (1 point) Compute the inverse of the following function: $f(x) = \dfrac{2x - 1}{2x + 1}$.

Short Answer Questions-II

7. (2 points) There are two parts in this question.

   (a) (1 point) Calculate a such the following function is continuous for all x. $f(x) = \begin{cases} ax - 1 & \text{if } x \leq 1 \\ 3x^2 + 1 & \text{if } x > 1 \end{cases}$

   (b) (1 point) Compute $\dfrac{dy}{dx}$ if $f(x) = \dfrac{1 - x^2}{1 + x^2}$.

8. (2 points) The demand function for *Lollafalooda* tickets is given by

$$p = 8000 - 100q$$

(a) (1 point) Compute the marginal revenue.

(b) (1 point) Calculate the approximate revenue from selling the 41st ticket.

Rough Work