<div align="center">

Exam Review #2
Math 264
Exam date 10/18/2000

</div>

<div align="center">

Topics Covered: Sections 12.1-12.5, 12.7-12.9

</div>

- **Functions of two and three variables**

  - Domain and range.
  - Graphs and level curves of functions of two variables.
  - Level surfaces of functions of three variables.

- **Limits and continuity**

  - Definition of limit and properties.
  - Definition of continuity.
  - The two-path test for non-existence of limits.

- **Partial derivatives**

  - Definition and geometric interpretation.
  - Higher order partial derivatives.
  - The mixed derivative theorem.

- **Differentiability and linearization**

  - Continuous partial derivatives imply differentiability.
  - Linearization (tangent plane).
  - Error in the standard linear approximation.

- **The chain rule**

- **Directional derivatives**

  - Definition as a limit. Geometric interpretation.
  - Relation between gradient and directional derivatives.
  - Properties of directional derivatives: directions of maximum increase and decrease, direction of zero change (normal to gradient).
  - Gradient is normal to level surfaces.

- **Optimization**

  - Local maximum and minimum, saddle points.
  - First derivative test. Critical points.
  - Second derivative test.
  - Absolute extrema on closed bounded regions.

- **Lagrange multipliers**

<div align="center">

Study Problems - Chapter 12

</div>

- p. 994–998: 3, 5, 7, 9, 11, 15, 17, 19, 23, 25, 29, 31, 33, 35, 41, 43, 45, 49, 51, 53, 55, 57, 59, 61, 63, 65, 67, 71, 73, 79, 83, 87, 97 (practice problems).

- p. 998–999: 2, 7, 9, 13, 21, 23 (additional problems).