Engineering and Science Mathematics I

Review for Midterm I

October 7, 2002

1. Limits, one-sided limits. In particular questions like Example 13, p.73, Example 7, p.81 ("squeeze law"), trigonometric limits (exercises on p.85).

2. Continuity: When is a function continuous, can a discontinuous function be extended to be continuous (p.97 examples 57–60)? Show that differentiability implies continuity.

3. Derivative: Definition, compute the derivative in simple cases as the limit of a difference quotient; differentiation rules; derivatives of trigonometric functions, log, exp.

4. Implicit differentiation, derivatives of inverse functions. E.g., know how to derive the derivatives of ln, arctan, etc.

5. Minimax problems: Finding critical points; when does a critical point correspond to a minimum, when to a maximum? Applied Minimax problems (Section 3.6).

Exam rules:

- No notes and calculators.

- Paper will be supplied.

- Please leave the 3rd, 6th, 9th, row free (until all other rows are completely occupied).

There is an extra office hour Tuesday, October 8, 12:30 in West Hall 4.