Content of final exam

You will have the opportunity to demonstrate understanding of the following topics.

- Limit.
  - Know the formal definition of limit and apply it to a particular function by writing an $\varepsilon - \delta$ proof. Section [2.5].
  - Know and apply "Main Limit Theorem". Section [2.6].
  - Know and apply limits of trigonometric functions. Section [2.7].
  - Find limits at infinity and infinite limits. Section [2.8].
- Continuity.
  - Know the formal definition of continuity and apply it to a particular functions. Section [2.9].
- The derivative.
  - Know that the derivative can be thought of as the slope of a line tangent to a curve at a point. Section [3.1].
  - Know that the derivative is the rate of change in the value of a function at a point. Section [3.1].
  - Know the formal definition of derivative and use it to show a given function has a given derivative. Section [3.2].
  - Apply rules for finding derivatives. Sections [3.3] [3.4] [3.5] [3.7] [3.8].
  - Expect a "related rates" problem. Section [3.9].
- Applications of the derivative.
  - Maxima and minima. Section [4.1].
  - Graphing. You will not be asked to make an entire graph, but you will be expected to identify intervals on which a function is increasing(decreasing), local minimum and maximum points, and points of inflection.Section [4.6].
- The integral.
  - Indefinite integral. Section [5.1].

  - Separable differential equations. Section [5.2].
  - Definite integral. Section [5.5].
  - Evaluating definite integrals. Section [5.8].

- Applications of the integral.
  - Area. Section [6.1].
  - Volume. Sections [6.2] [6.3].
  - Length of a plane curve. Section [6.4].
  - Moments, center of mass, centroid. Section [6.6].

Notes, formula sheets, and calculators

- Notes and formula sheets are not allowed.
- You may use a calculator, but you are reminded that, unless otherwise stated in a particular problem, credit will be given only for exact answers and not for approximate answers.
- Trigonometric identities. A few identities turn up frequently in the textbook problems. Consequently, you should have no trouble knowing these identities.