REVIEW for MATH 1690, April 2008

DEFINITIONS and FORMULAS:

1. General limit, one-sided limits, limits at infinity and infinite limits, continuity, removable discontinuity.

2. Derivative, tangent line, normal line, horizontal and vertical asymptotes.

3. Inverse functions, exponential and logarithmic functions, inverse trigonometric functions.

4. Local and absolute extremes, critical point, singular point.
   Functions concave up, concave down, inflection point, horizontal, vertical and oblique asymptote, indeterminate forms, L'Hospital's two rules, antiderivative.

*. Induction, Taylor polynomials, Lagrange form of the remainder.

5. Partition, Riemann sum, upper and lower Riemann sums, integrable function, definite integral. (List of antiderivatives on p. 506)

6. Areas between curves, volumes by slicing, volumes by cylindrical shells.

7. Integration methods: substitution, integration by parts, inverse trigonometric substitution, trigonometric integrals, rational functions; improper integrals.

8. Arc length, area of a surface of revolution.

10. Parametric curve, tangent line of a parametric curve, arc length of a parametric curve, area of surface of revolution for parametric curves, polar coordinates,

THEOREMS:

1. Theorem on operations on limits, Squeeze theorem,.

2. Max.– Min. theorem, Intermediate value theorem.

3. Theorem on differentiability and continuity.

4. Mean value theorem, Fermat's theorem, Rolle's theorem.
   First derivative test, second derivative test, L'Hospital's rule (first and second).

5. Continuous functions are integrable, mean value theorem for integrals, fundamental theorem of calculus (two parts).

7. p- integrals, comparison theorem for improper integrals.