Exam 1:

1. Types of mathematical objects. Numbers, sets, functions, domains and ranges.
2. Linear functions and their equations.
3. Intervals of real numbers and interval notation. The standard notation f : A ---> B.
4. Graphs of functions. Manipulation of graphs by translation and stretching.
5. Operations on functions. The four arithmetic operations. Composition of functions.
6. Tangent lines, calculating the slope of a tangent line using a limit.
7. Limits, intuitively. Evaluation of finite and infinite limits. One-sided limits. Vertical asymptotes.
8. Continuity, the Intermediate Value Theorem.

Exam 2:

1. Geometric meaning of the derivative. Its definitions using limits (Sec. 3.1-3.2).
2. Algebraic computation of derivatives using the Product Rule, Quotient Rule, and Chain Rule (Sec. 3.3, 3.5).
   The Chain Rule is of fundamental importance and will be used in several problems!
3. The two fundamental trigonometric limits, and their use in computing other limits (Sec. 3.4).
4. The relation between differentiability at a point, differentiability on an open interval, and continuity (Sec. 3.2).
5. Implicit differentiation (Sec. 3.6).

Exam 3:

1. Rates of change and related rates problems. Examples of rates of change. Expect a rates of change or related rates word problem. (Sec. 3.7-3.8)
2. Linear approximation and differentials. Know the approximation formula and be able to use it. Know the definition of differential and be able to compute the differential of a function. (Sec. 3.9)
3. Absolute and local maxima and minima. The Extreme Value Theorem. Fermat's Theorem. Critical number of a function. (Sec. 4.1)
4. The Mean Value Theorem - statement, geometric meaning, applications. (Sec. 4.2)
5. Effect of the first and second derivative on the graph of a function. Using them to find local maxima and minima of functions. Critical numbers, inflection points. (Sec. 4.3)
6. Limits at infinity. Know the basic idea and the geometric meaning, and be able to calculate easy examples. Horizontal asymptotes. Infinite limits at infinity. (Sec. 4.4)
7. Sketching the graph of a function by using calculus. Slant asymptotes. (Sec. 4.5)

Material covered after Exam 3 (which will be on the final exam):

1. Optimization problems. (Sec. 4.7)
2. Newton's method. (Sec. 4.8)
3. Antiderivatives. (Sec. 4.9)