

## Responsibilities for Test 3: An In-class Exam

### Wednesday, Dec 5

The Chain Rule - Know how to apply the rule to simple composite functions, longer chains of compositions, and to more complicated functions in which the Chain Rule is applied along with the other rules (really, theorems) of differentiation, such as the rules for sums, differences, products, quotients, power functions, trigonometric functions, the natural exponential function and the natural logarithm function (this includes confirming the result of an antidifferentiation determined for an integral problem - know how to apply the Chain Rule to the process of implicit differentiation - Practice problems:  
**2.5, pp 119-121: 25,37,41,43,53,61**

Differentials - Know how to apply the definition of differential (p 135) to functions, especially for an integral problem involving the method of Direct Substitution as described in the next section below - Practice problems:  
**2.8, p 137: 18; 5.5, p 298: 3**

The Method of Direct Substitution - Know how to apply the method, **given the substitution** (as in problems 1,4,5 below), know the notation and meaning of *indefinite integral* and how to express the most general antiderivative of a function as described on pages 276-277 - Practice Problems:  
**5.5, pp 298-299: 1,4,5,7,11,43,45**

The Process of Implicit Differentiation - Know how to apply the procedure to determine the derivative of a function defined implicitly and determine the slope of tangent lines at various points on the graph of the defining equation - Practice Problems:  
**2.6, pp 125-126: 5,9,21**

The Natural Exponential Function - Know how to apply the derivative formula for the natural exponential along with all the other differentiation rules, as in the description of Chain Rule responsibilities listed above - know the algebraic properties of exponents listed on page 144 - Practice Problems:  
**3.3, pp 166-167: 21,23,30,37,57**

The Natural Logarithm Function - Know how to apply the derivative formula for the natural logarithm along with all the other differentiation rules, as in the

description of Chain Rule responsibilities listed above - know the first algebraic properties, ones depending only on the logarithm being an inverse function, of logarithms listed on page 156 - Practice Problems:

**3.3, pp 166-167:** 11,15,44; **Review Exercises, p 196:** 21,29

The Process of Determining a Formula for the Inverse of a 1-1 Function - Know how to apply the procedure described at the top of page 151 to determine the inverse of a 1-1 function - Practice Problems:

**3.2, p 159:** 23,31,33