

## **Topics for Chapter 3 Test 2**

### 1) Rates of Change

- a. Position, velocity, and acceleration
- b. Other rate of change problems; Quantities, etc. (Section 3.4), not including marginal cost.

### 2) Both versions of the Chain Rule

- a. Chain Rule #1:  $\frac{d}{dx} f(g(x)) = f'(g(x)) \cdot g'(x)$
- b. Chain Rule #2  $\frac{dy}{dx} = \frac{dy}{du} \frac{du}{dx}$

### 3) Implicit Differentiation

- a. When taking the derivative of  $y$ , add a  $y'$  at the end.
- b. Solving for  $y'$
- c. Solving for  $y''$

### 4) Derivatives of Inverse Trig, Log, and Exponential Functions

- a. Derivative of  $\sin^{-1}(x)$ ,  $\cos^{-1}(x)$ , and  $\tan^{-1}(x)$
- b. Derivative of  $a^x$ ,  $\log_a x$ ,  $\ln x$ , and  $e^x$ .
- c. Logarithmic differentiation; taking the log of both sides as in  $y = x^x$

One note sheet per group is allowed with the same rules applying as on previous tests.