## Quiz 5 for Mathematics 223 Introductory Analysis I - Fall 2000 Material Covered: Sections 3.6,3.7 of workbook and text For: Friday, 3rd November

This is a 15 minute quiz, worth 5% and marked out of 5 points. The total possible points awarded for each question is given in square brackets at the beginning of each question. Anything that can fit on one side of an  $8\frac{1}{2}$  by 11 inch piece of paper may be used as a reference during this quiz. A calculator may also be used. No other aids are permitted.

Name (please print):		ID Number:
	last	first

- 1. [1] For y = 3x 2, x = 1 and  $\Delta x = 0.2$ ,
- $\Delta y =$ \_\_\_\_\_
- **2.** [1] If  $y = (2x^4 + 1)^{5/2}$ ,
- *dy* = \_\_\_\_\_
- **3.** [2] If  $4xy^2 + x^{7/2} = 3y$ ,

 $\frac{dy}{dx} =$  \_\_\_\_\_\_

4. [1] Find the rate of change in *profit*, if

$$R(x) = 25x - 0.7x^{2}$$
  

$$C(x) = 8x - 10$$

where x = 21 and  $\frac{dx}{dt} = 20$ .

(1)  $\Delta y = 0.6$ 

$$\Delta y = f(x + \Delta x) - f(x)$$
  
= 3(x + \Delta x) - (3x - 2)  
= 3\Delta x  
= 3(0.2) = 0.6

(2) 
$$dy = \frac{5}{2}(2x^4 + 1)^{3/2}(8x^3)dx$$
  
(dx is an important component!)

(3) 
$$\frac{dy}{dx} = \frac{4y^2 + \frac{7}{2}x^{5/2}}{3-8xy}$$

$$4(x2y\frac{dy}{dx} + (1)y^2) + \frac{7}{2}x^{5/2} = 3\frac{dy}{dx}$$
  

$$8xy\frac{dy}{dx} + 4y^2 + \frac{7}{2}x^{5/2} - 3\frac{dy}{dx} = 0$$
  

$$(8xy - 3)\frac{dy}{dx} = -4y^2 - \frac{7}{2}x^{5/2}$$

(4) 8152

$$P = 17x + 9.3x^{2}$$

$$\frac{dP}{dt} = 17\frac{dx}{dt} + 9.3(2)\frac{dx}{dt}$$

$$= (17 + 18.6x)\frac{dx}{dt}$$

$$= (17 + 18.9(21))(20)$$