

Homework # 4  
Due: 6/13/06

1. Differentiate the following:

(a)  $f(x) = x^2(\cos x)(\sin x)$

(b)  $f(x) = \frac{\tan x - 1}{\sec x}$

(c)  $f(\theta) = \frac{\sin \theta(\theta + \tan \theta)}{1 + \sec \theta}$

(d)  $f(x) = \frac{(x-1)^4}{(x^2+2x)^5}$

(e)  $f(x) = \sin \left( \tan \left( \sqrt{\sin x} \right) \right)$

2. Find  $dy/dx$  by implicit differentiation:

(a)  $1 + x = \sin(xy^2)$

(b)  $\tan(x - y) = \frac{y}{1+x^2}$

3. Find the first and second derivatives of  $f(x) = x^n$ , where  $n$  is any number.

4. §3.9 # 16

5. Find the linearization of  $f(x) = x^{1/3}$  at  $a = -8$