

## Problem Sheet 2 for 6401

Due Thursday 20 Oct 2011, at the Problem Class. You should hand in solutions to all problems, but only some of them will be marked. The deadline for handing in your work is 11.55 am.

1. Differentiate the following functions

(a)  $f(x) = \frac{7e^{\sin(x^2)} + 3x}{\tan(\cos x)}$ ;

(b)  $f(x) = \left( \frac{3x^2 + 7}{\arcsin x + \arctan x} \right)^3$ ;

(c)  $f(x) = [(1 + 1/x)^{-1} + 1]^{-1}$ .

2. Find the equation of the tangent line to the graph of  $y = \frac{2}{1+x^2}$  at the point

(a)  $P = (1, 1)$ ;

(b)  $Q = (0, 2)$ .

3. Find the maximal and minimal values of

$$f(x) = 5 - 6x^2 - 2x^3$$

on  $[-3, 1]$ .

4. Find the critical values of

$$g(x) = (x^2 - 1)e^x$$

and classify them as local max, min, etc.