Queen Mary
University of London

MTH4101 Calculus II, Spring 2013

Problem sheet for Tutorial 3

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- The questions are designed to help you with material covered in Week 3 and 4. You will get help with them in the tutorial on 31 January or 1 February.
- You should write up your solution to the starred question (*) clearly and hand it in to your personal tutor in your assigned tutorial on 7 or 8 February for feedback. *Remember to put your full name and student number on the top of your solution.* Your marked solution to the feedback question will be returned to you in your tutorial on 14 or 15 February.
- It is important that you try to do all of the questions.

(*)1: Find all the local maxima, local minima and saddle points of the function

$$f(x,y) = 9x^3 + \frac{y^3}{3} - 4xy.$$

2: Use the method of Lagrange multipliers to find the extreme value of the function

$$f(x,y,z) = xy + 2xz + 2yz$$

subject to the constraint $xyz = 32$. [2010 exam question]