Problem Set 2

MATH 16B Spring 2016

11 February 2015

Exercise (7.3.26)**.** Find all maxima and minima of the function

$$f(x, y) = x^2 + 4xy + 2y^4.$$

Exercise (7.3.27)**.** Find all possible points where

$$f(x, y, z) = 2x^2 + 3y^2 + z^2 - 2x - y - z$$

could have a maximum or minimum.

Exercise (7.4.6)**.** Minimize

$$x^2 + xy + y^2 - 2x - 5y$$

subject to the constraint

$$1 - x + y = 0.$$

(Note: you do not have to verify that the point you find is indeed a minimum).

Exercise (7.4.19)**.** Find the values of x, y, z that maximize

$$h(x, y, z) = 3x + 5y + z - x^2 - y^2 - z^2$$

subject to the constraint

$$g(x, y, z) = x + y + z = -6.$$

(Note: you do not have to verify that the point you find is indeed a maximum).

Exercise. State precisely

- the first derivative test for a function of two variables, and
- the second derivative test for a function of two variables.