

BEE1020 – Basic Mathematical Economics	Juliette Stephenson Amr Algarhi
Homework Week 5	Department of Economics University of Exeter

You must submit your solutions by Monday 5pm at the reception.

Please do not forget to write your name and your tutorial group (name of tutor, day of week, time) on your answer sheet.

Exercise 1 Find the critical point of the functions

$$\text{a) } z = f(x, y) = xy - 2x + 3y - 6$$

$$\text{b) } z = g(x, y) = 2x^2 + 2xy - 6x + 5y^2 - 6y + 5$$

$$\text{c) } z = h(x, y) = -2x^2 - 2xy + 6x - 5y^2 - 5$$

Determine whether they are troughs, peaks or saddlepoints.

Exercise 2 A dairy produces whole milk and skim milk in quantities x and y gallons, respectively. Suppose that the price of whole milk is $p(x) = 20 - 5x$ and that the price of skim milk is $q(y) = 4 - 2y$ and assume that $C(x, y) = 2xy + 4$ is the total (!) joint-cost function of the commodities. What should x and y be to maximize profit?