## Mathematics for Business I

## 1<sup>st</sup> G.A.D.E., Academic Year 2011/12

Control Unit 3 (Option A)

SURNAME(S): ...... NAME: .....

You must write your answers in this sheet. They must be just the final answers, you mustn't write your calculations on this sheet. Use the other sheet for you calculations; you must give the lecturer that sheet also, although it won't be taken into account.

- 1. Let  $Q(x, y) = (x 1/2)^{1/2} (y 1/2)^{1/2}$  a production function measuring the quantity produced of a good depending on the quantities x and y of two inputs A and B.
  - a) (0.1 points) Is Q is an homogeneous function? If so, say what kind of returns (increasing, decreasing or constant) has Q, and explain what it means.
  - b) (0.1 points) Calculate and represent graphically the domain of Q.

c) (0.1 points) Calculate and represent graphically the isoquant of level 1. Calculate one point on that isoquant.

d) (0.1 points) Calculate both marginal productivities at any point (x, y).

- e) (0.15 points) At present, x = 3/2 and y = 3/2. If you want to increase the production and you can only increase one of the inputs, which one would you suggest to increase its quantity and why?
- f) (0.15 points) At present, x = 3/2 and y = 3/2. Calculate how an increase of 1% in the quantity of B would affect the production.
- g) (0.15 points) At present, x = 3/2 and y = 3/2. Calculate how should the quantity of B change if we want to decrease the quantity of A in 1/2 units, keeping the production at the same level.
- h) (0.15 points) At present, x = 3/2 and y = 3/2. How would the production vary if we decrease the quantity of A in 1/8 but we increase the quantity of B in 1/10?