

## MBA Maths 2009

### Quiz 4

#### Question 1

(a) The quantity demanded  $Q$  is a linear function of price. When price  $P=0$  the demand is 100. When price  $P=50$  the demand is zero. Give an equation for the quantity  $Q$  in terms of price  $P$  you should have  $Q$  on the left and an expression of the form  $b+mP$  on the right.

(b) The quantity supplied  $S$  is zero if the price is less or equal to than the unit cost of \$1.50. For every extra 25 cents above this, the quantity supplied rises by 2 units. Give an equation for the quantity supplied  $S$  in terms of price  $P$ . You should have  $S$  on the left and an expression of the form  $b+mP$  on the right.

(c) What is the equilibrium price and quantity?

#### Question 2

Sketch the following function

a.  $y=3x^2+9x+6$

On the graph indicate the following

- (i) The point/s at which the function crosses the x-axis
- (ii) The point at which the function crosses the y-axis.
- (iii) The value of  $x$  which minimizes or maximizes the function.
- (iv) The minimum/maximum value of the function

### Question 3

Suppose you are given the following information about the monthly demand for Bernoulli Systems' trading software.

- If the price is \$0, the demand for the software will be 45 units per month. For every increase in price of \$3, the monthly demand will decrease by 3 units.
  - Fixed costs are \$175 per month and variable costs are \$5 per unit sold.
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- (i) Write down the cost  **$C$**  of a unit of software as a function of demand  **$Q$** .
  - (ii) Write down the demand  **$Q$**  for the software as a function of price  **$P$** .
  - (iii) If revenue,  **$R$**  is given by  **$R=PQ$** , write down revenue as a function of price.
  - (iv) Using your answers to (i) and (ii), write down cost,  **$C$** , as a function of price,  **$P$** .
  - (v) If profit,  **$Pr$** , is given by  **$Pr=R-C$** , and write down an expression for profit as a function of price.
  - (vi) Graph  **$Pr$**  vs  **$P$**  On your sketch you should indicate
    - a. The prices at which Profit=0
    - b. The price which maximizes profit
    - c. The value of profit at this price.