Econ 3012 - Final Exam

December 7, 2023

1. *Briefly describe the following in a way that a person who* ***has not studied economics or mathematics would understand****:*

A. Why does a firm choose to operate where marginal cost is equal to marginal revenue?

B. What is a two-part tariff?

C. What does it mean for a production function to have decreasing returns to scale?

2. *Fill in the blank***.**

A. We can be sure a consumer who is a borrower will remain a borrower and be strictly better off when ______________________.

B. If some of a consumer's indifference curves slope upwards, the consumer's preferences are not ______________________.

C. In general equilibrium, prices are said to be equilibrium prices if ______________________ for every good is equal to ______________________.

3. A market's demand is $Q = 3000 - p$. Each firm in the market has zero cost. That is $c(q) = 0$.

> A) If there is only one firm in this market (a monopolist), what is their profit function?
>
> B) What quantity does a monopolist produce to maximize profit?
>
> C) If there are two firms in this market. Firm 1 produces q_1 and firm 2 produces q_2, what is firm 1's profit function?
>
> D) What is firm 1's best response function?
>
> E) What quantities do the firms produce in a symmetric Nash equilibrium?
>
> F) If the firms agree to collude and each choose the same quantity q, what q will maximize their joint profits?

4. A firm has production function $f(x_1, x_2) = x_1^{\frac{1}{3}} x_2^{\frac{1}{3}}$. Price of input 1 is $w_1 = 4$ and price of input 2 is $w_2 = 1$.

> A) Does this firm have increasing, decreasing, or constant returns to scale?
>
> B) What are the x_1 and x_2 that minimize the cost of producing output y?
>
> C) What is the firm's cost function in terms of output y?
>
> D) If this firm was a price-taker and the price of output was $p = 600$ what is the firm's profit function?
>
> E) What output would the firm produce in part D?
>
> F) Show that firm's production function is homothetic.

5. In a market, demand is $Q = 400 - p$ and supply is $Q = 3p$.

> A) What is the equilibrium price and quantity in this market?
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> B) What is the price elasticity of demand at the price you found in part A?
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> C) Given your answer to part B, if price were to increase by 1%, approximately what would happen to demand?
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> D) What is the equilibrium price and quantity if the government imposes a $t = 200$ quantity tax?
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> E) What is the dead-weight-loss associated with this tax?