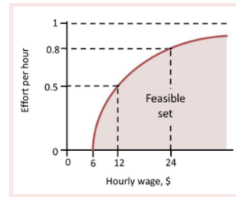


## ECO111 Problem Set 8

24 October 2024

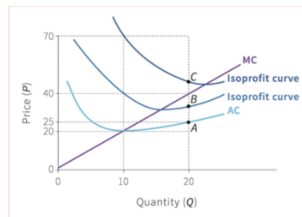
1. Thomas earns £12 per hour in his current job and works 36 hours a week. He loves his job and puts in his maximum effort with no disutility. In fact, Thomas earns extra utility worth £3 per hour from camaraderie, status, and enjoyment of the job. If he loses this job Thomas has two choices. Either he is able to be self-employed, which earns him £7 an hour for 36 hours a week of work but also gives him disutility equivalent to £2 per hour, or he can be unemployed and receive an unemployment benefit of £150 per week. Thomas is expected to be able to find another job similar to his current one in 24 weeks. What is Thomas's employment rent?
2. The following figure depicts an employee's best response to wage when the expected unemployment duration is 44 weeks. Which of the following statements is correct?



- (a) In order to induce an extra effort of 0.1 per hour at any particular wage level, the employer needs to increase the hourly wage by \$3.
  - (b) The slope of the best response curve is the employer's marginal rate of transformation of higher wages into worker effort.
  - (c) A fall in the unemployment rate would reduce the reservation wage to below \$6.
  - (d) The employer would still have to pay \$24 per hour to have the effort level of 0.8 even if there is an increase in the unemployment benefit.
3. Consider a worker's best response curve in the labour discipline model. Currently the firm chooses to pay £12 per hour to minimise the cost of

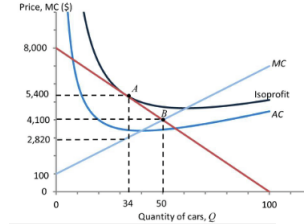
effort, which induces an effort level of 0.6 from the worker. Now consider a rise in the unemployment benefit. Choose the correct statement.

- (a) At the wage rate of £12 per hour the worker will now exert more than 0.6 of effort.
  - (b) The firm can lower the wage rate to below £12 to maintain the effort level of 0.6.
  - (c) The firm's new wage offer that minimises the cost of effort will be higher than £12.
  - (d) The firm's maximum units of effort per dollar of wage cost will be higher than before the rise in the unemployment benefit.
4. A firm produces 24 units of output with 10 workers and 4 machines. Which of the following statements are correct?
- (a) If the firm produces 48 units of output with 20 workers and 4 machines, then the firm's technology exhibits constant returns to scale.
  - (b) If the firm produces 10 units of output with 5 workers and 2 machines, then the firm's technology exhibits increasing returns to scale.
  - (c) If the firm produces 30 units of output with 15 workers and 6 machines, then the firm's technology exhibits decreasing returns to scale.
  - (d) If the firm produces 24 units of output with 20 workers and 8 machines, then the firm's technology exhibits constant returns to scale.
5. The diagram depicts the marginal cost curve (MC), average cost curve (AC), and the isoprofit curves of a firm. From this information, we can deduce that:

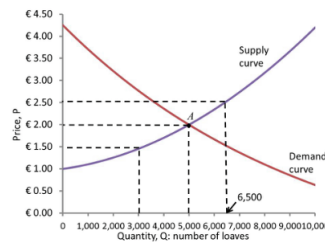


- (a) The slope of the isoprofit curve at A is 1.5.
- (b) The price at B is 30.
- (c) The profit margin at C is 10.
- (d) The slope of the isoprofit curve at C is 0.75 (in absolute value).

6. The figure depicts the demand curve of a firm producing cars, together with its marginal cost, average cost, and isoprofit curves. What is the consumer surplus and producer surplus at the profit maximizing outcome?



7. Demand faced by a monopolist is  $Q = 20 - 0.5P$ . Her marginal cost is 10. What is the profit maximizing quantity and price of production for the monopolist?
8. The diagram shows the market demand and supply curves for the bread market. You know that there are 250 bakeries operating in the market producing the same bread, but you do not know their cost structure (i.e. their average cost and marginal cost curves). Based on this information, which of the following statements is correct?



- (a) At a price of €2.50, each bakery will sell 26 loaves each.
- (b) In equilibrium, each bakery supplies 18 loaves each.
- (c) At a price of €1.50, all of the bakeries would be making a loss.
- (d) A bakery's marginal cost of producing the 21st loaf is €2.
9. The figure shows the demand and supply curves in the salt market. The government imposes a sales tax of 30% on the price of salt, to be paid by the suppliers. As a result, the equilibrium quantity falls from  $Q^*$  to  $Q^T$ . What is the gains from trade?

