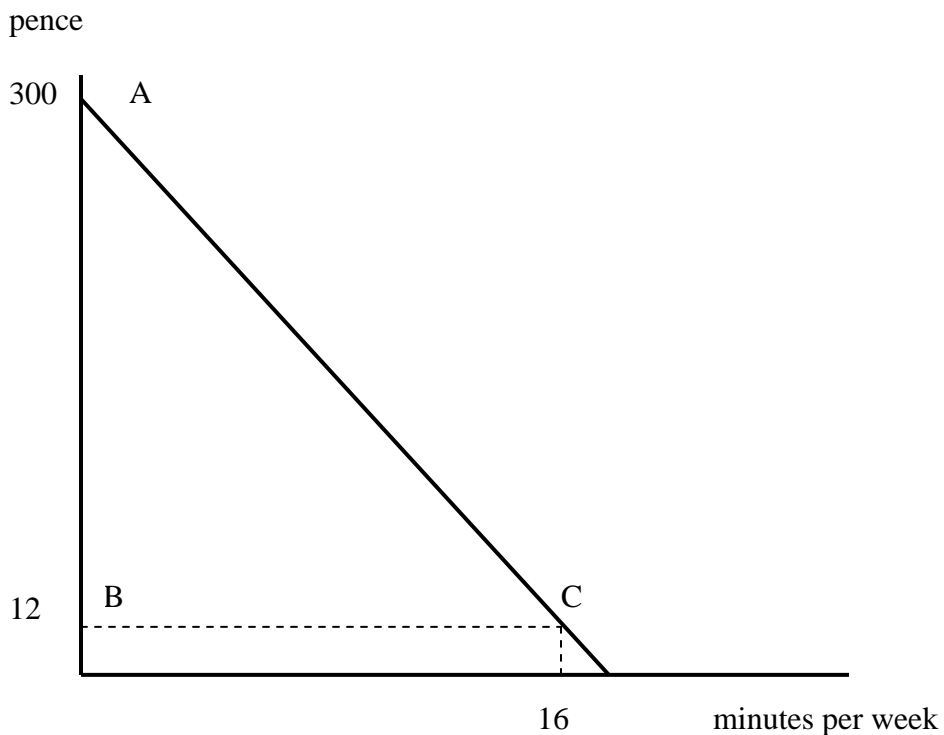


EC111 Class Exercise 4: Outline Answers

1.

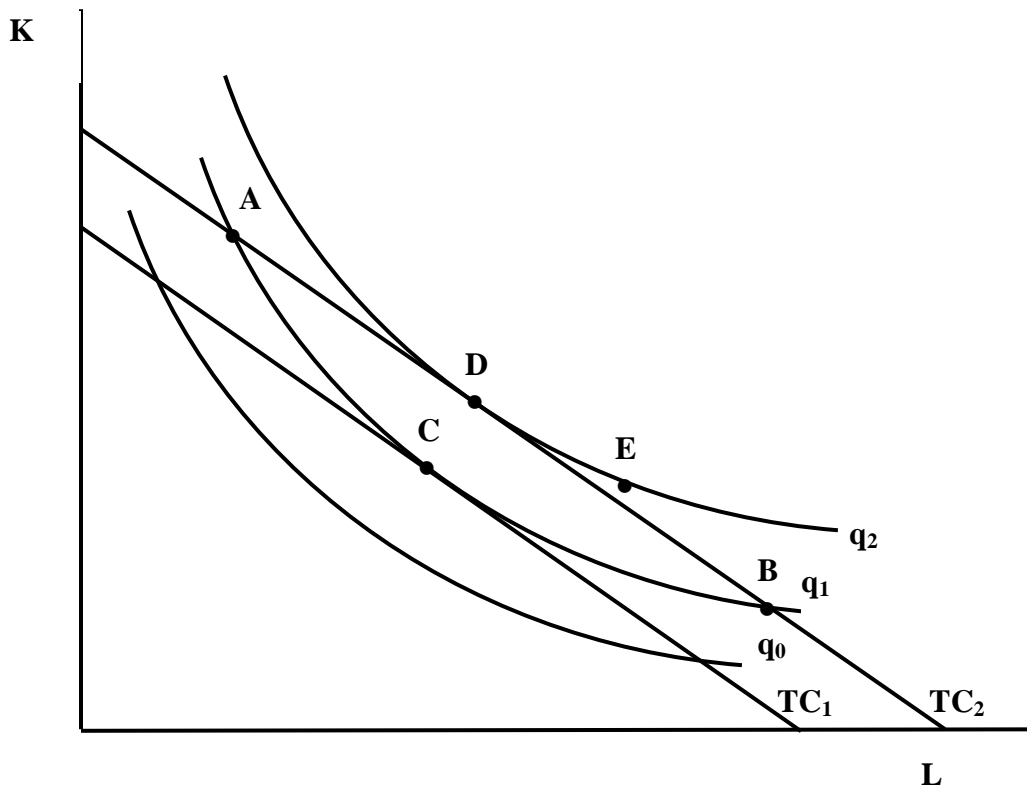


- (a) Price is $P = 12$ so from the demand function, $12 = 300 - 18q$; $q = 16$.
- (b) Consumer surplus is the area ABC or $\frac{1}{2} \times (300 - 12) \times 16 = 2304$ pence, or £23.04.
- (c) John will be willing to pay any fixed fee that is less than the value of consumer surplus. So he will pay a fee of £5 but not a fee of £25.

2.

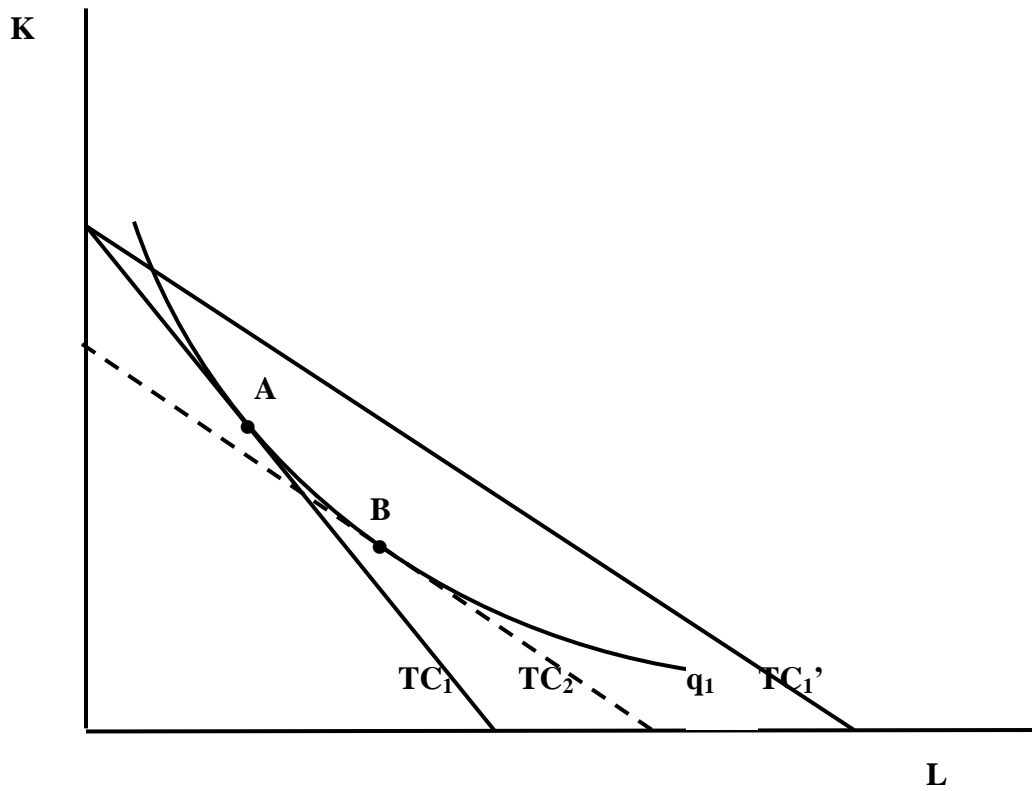
We need to know the value of the ladder at the end of the year. Say it is £60. We also need to know the interest rate in order to calculate the foregone interest on the £100 investment. If the interest rate is 10 percent then the opportunity cost of the funds invested is £10. Thus depreciation + foregone interest is £40 + £10 = £50. Finally we need to know the opportunity cost of the window cleaner's own labour, say £6,000. True economic profit is total revenue minus all (opportunity) costs. Using these figures, that would be $£8,000 - £1,000 - £50 - £6,000 = £950$.

3.



a. From the lecture notes. At point A the MRTS is greater than the ratio of factor prices (the isoquant, q_1 is steeper than the isocost curve, TC_2). Because the marginal product of labour is high relative to the marginal product of capital, by shifting down the isoquant the firm can produce the same output at a lower total cost (point C). Alternatively the firm could produce a higher output at the same cost (point D). The firm minimises the cost of a given output at a point of tangency such as C or D.

b. Suppose point D represents an equal proportionate increase in capital and labour, as compared to point C. If q_2 represents a greater proportional increase in output then there are increasing returns to scale. In this case the isoquants are 'close together'. If q_2 is a long way above q_1 then the firm has to increase its employment of factors more than in proportion to the increase in output.



c.
 The fall in the wage shifts out the isocost curve along the horizontal axis, from TC_1 to TC_1' . The firm could produce a higher level of output at the same cost. Holding the level of output constant at q_1 , the firm can produce at a lower cost, TC_2 . In order to minimise the total cost the firm chooses point B, using more labour but less capital. This is the factor substitution effect.