

Economics 3550
Intermediate Microeconomics
Professor Rous
Mid-Term Exam 2
March 29, 2004

Name KEY
Clearly label all graphs for full credit and
please write legibly; I cannot grade what I
cannot read.

Number of points each question is worth in parentheses.

1. (6) A negatively sloped Engel curve indicates that a good is Inferior.

2. (6) The price of three goods Sally buys has risen. Identify each as normal, inferior non-Giffen, or Giffen.
 - a. (Substitution effect = -6, Income effect = 8) the good is Giffen.
B/c sub and inc effect in opposite directions and inc effect is larger.

 - b. (Substitution effect = -22, Income effect = -3) the good is Normal.
B/c inc and sub effect the same direction

 - c. (Substitution effect = -10, Income effect = 5) the good is Inferior (not Giffen).
B/c inc and sub effect in opposite directions and inc effect is smaller

3. (6) Is it possible to say that either the income or substitution effect is more important to what economists call the Law of Demand? If so, explain.

The Law of Demand states that when price rises, Q_d falls and when price falls, Q_d rises. The substitution effect is more important to the law of demand because when price rises, the sub effect is negative and when price falls, the substitution effect is positive. The income effect can be the opposite of a price change if the good is normal (reinforcing the Law of Demand), but is the same direction as the price change if the good is inferior (running counter to the Law of Demand). In fact, if the good is inferior and the income effect is large enough, the Law of Demand won't hold (i.e. Giffen goods).

4. (6) Demand for basketballs can be represented by the following demand equation:

$$P = 100 - .4Q$$

Using the point elasticity equation, if the Price of basketballs is \$40, what is the price elasticity?

$$E = (1/\text{slope}) * P/Q$$

$$\text{Slope} = -.4$$

$$\text{If } P = 40, Q_d = 150$$

$$\text{Therefore, } E = (1/.4) * (40/150) = 2.5 * .266666 = .6666 = 2/3$$

5. (6) Michael Finely (a basketball player for the Dallas Mavericks) demands a \$2m per year increase in salary and is given the pay raise. What change in ticket prices (increase, decrease or no change) would you expect to see. Please explain.

Michael Finely gets paid his salary whether he (or the Mavericks) play 82 games in the season or not (and the Mavericks will play 82). Therefore, the salary increase is a change in fixed cost. Since it will not affect the MC of producing games, it will not affect the team's pricing. In other words, the team is already charging a profit maximizing price for tickets. Since neither MC or MB have changed, that profit maximizing price will not change.

6. (6) Verbally explain why MC falls when MPL is increasing and vice-versa.

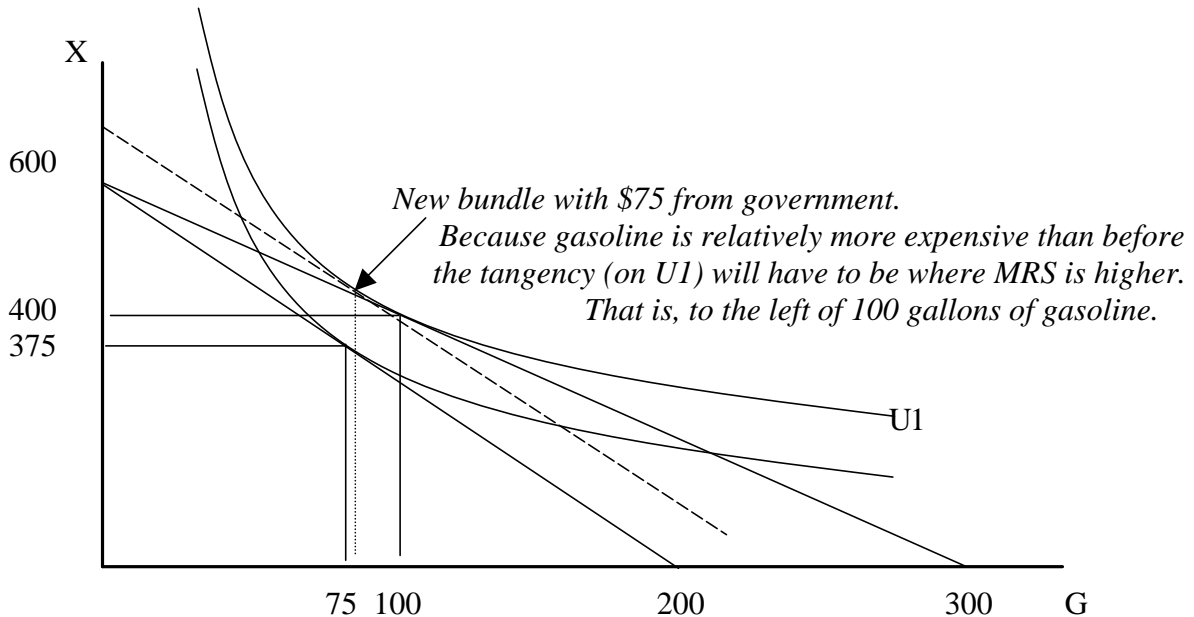
When MPL is rising, the amount of labor required to produce an additional unit is falling. As the amount of labor needed to produce one more unit falls, so does the labor cost of producing that unit. Therefore MC falls too. When MPL is falling, the amount of labor needed to produce the marginal unit rises, and with it, MC rises too.

7. (6) A firm decides to expand and increases capital from 200 to 240, labor from 450 to 490 and output increases from 3000 to 3300. Production is experiencing _____ and LRAC will _____.
- increasing returns to scale; fall
 - decreasing returns to scale; rise**
 - decreasing returns to scale; fall
 - increasing marginal returns; fall
 - decreasing marginal returns; rise

There was no right answer here, so I gave everyone full credit.

8. You currently have an income of \$600 and buy two goods, a composite commodity, X and gasoline, G. The price of the composite commodity is \$1 and the price of gasoline is \$2.00.

a. (5) At first, to maximize utility, you purchase 100 gallons of gasoline. Draw your consumption situation below.



Now assume the government imposes a tax of \$1.00/ gallon on gasoline (not to raise revenue but to lower consumption in order to reduce dependence on foreign oil).

b. (6) Draw in the new budget constraint and indifference curve assuming you now consume 75 gallons of gasoline. How much tax would you pay? \$75

Now assume the government mails everyone \$75 dollars (so that they, as voters, will be INDIFFERENT to the gas tax – that is, you can now afford the same level of UTILITY you enjoyed before the tax).

Is it possible that you will consume more than 100 gallons after the tax/refund program is in effect? Explain.

No. See explanation by arrow above.

c. (4) Will your final consumption of gas be lower if gas is inferior or normal? Please explain how you know.

Your final consumption of gas will be lower if gas is an inferior good. That is because the \$75 from the government is like an increase in income. If gas is normal, that increase in income leads to increased consumption of gas. If it is an inferior good, your consumption of gas will actually be lower than 75 gallons.

9. (6) Say the Big Eddie Company has the following production function: $Q = .5 * K * L^{.5}$
They currently have a fixed amount of capital at $K = 12$.

a. What is their MC equation?

$$TC = VC + FC, \text{ and } VC = P_L * L$$

To get L, square both sides of the production function to get $Q^2 = .25 * K^2 * L$

Then $L = Q^2 / (.25 * K^2)$, since $K = 12$, this reduces to $L = Q^2 / 36$

$$VC = P_L * L, \text{ so } VC = P_L * Q^2 / 36$$

$$FC = P_K * K = P_K * 12; \text{ Therefore, } TC = (P_L * Q^2) / 36 + P_K * 12$$

$$MC = dTC/dQ, \text{ so } MC = (P_L * Q) / 18$$

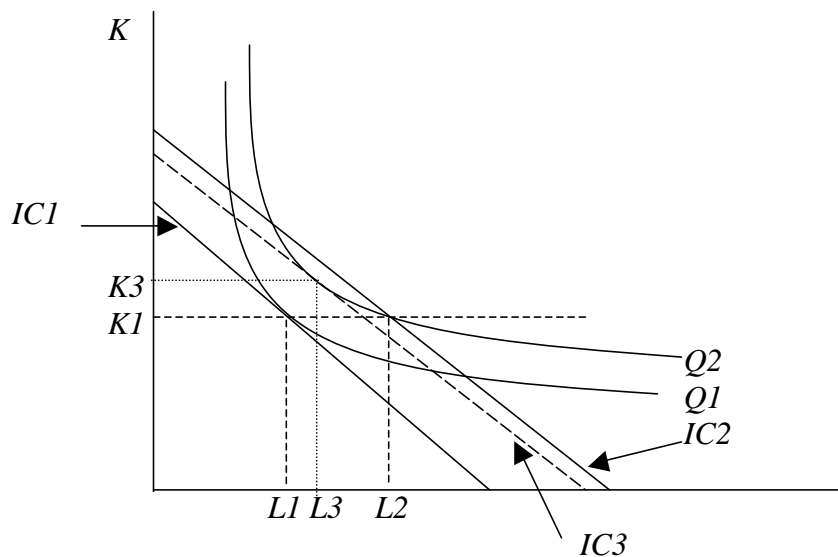
b. If they are currently using 9 laborers, what is their MRTS (there is more than one way to get a right answer)?

Using the production function, $MPL = dQ/dL = .25 * K / L^{.5}$ and $MPK = dQ/dK = .5 * L^{.5}$

Since $MRTS = MPL/MPK$, $MRTS = K/2L$. With $K = 12$ and $L = 9$, this becomes $12/18$. So $MRTS = 2/3$

10. (10) Marginal cost in the short run is always higher than marginal cost in the long run. Verbally and graphically explain why that is using isoquants and isocost curves.

MC is always higher in the short run because expanding production can be achieved only by increasing the use of variable costs (K fixed in the short run). Therefore they move off their expansion path and MRTS is not equal to PL/PK. In the long run, they can adjust by hiring more K which allows them to produce that same level of output at a lower cost.



Starting by producing Q1 with K1 and L1. Expand production to Q2 requires L2 labor in the short run, resulting in costs changing from IC1 to IC2. In the long run, the same level of output (Q2) can be produced with L3 and K3 and total cost would fall to IC3.

11. You have been hired by the Wayne's Wacky Widgets company as an economic consultant. It seems that while doing their best to maximize profit, they are losing \$2000 per month ($TR = \$10,000$, and $VC = \$8000$). They currently have a fixed cost of \$4000. Of the fixed cost, \$2400 is from a 2 year contract for their rent and \$1600 is pay for a security guard who can be fired at any moment **if you shut down** (ok, this last phrase was omitted on the exam because it never occurred to me that it would be read any other way – after all this was one the examples I used on class of a fixed, but not sunk, cost. Even if you didn't read it this way, if your analysis was still correct, you should have received full credit).
- a. (5) As the consultant, what is your advice, and why.

Right now, $TR > VC$, so the firm should keep producing. By continuing to produce, the firm loses \$2000, but if they shut down, they would lose \$2400 (but not \$4000 since the security guard, although a fixed cost, is not sunk).

- b. (5) Now you hear that the company has negotiated a deal to get their rent lowered to \$1800 per month. Would this change affect your analysis? Explain.

Even though the rent has fallen to a level below the loss of \$2000 from above, the firm should still continue to produce because the loss has fallen to \$1400. So again, the loss from producing is still less than the fixed and sunk cost of \$1800.

12. (8) In the last four months, the price of steel has risen by about 70%. The majority of the increase is caused by an increase in demand for steel by China. This has caused the U.S. to be a net exporter of steel and driven the price of steel in the US up. Some have called for the U.S. to limit steel exports which would keep domestic supply higher and cause the price to fall. How would Hazlitt respond to such a proposal?

Hazlitt would argue against the proposal. He would argue that the high price of steel will do more to increase the amount of steel being produced than any policy. The policy will also discourage the efficient use of steel in the world.

Scratch Sheet

Name _____

4. (6) Compensated demand curves cannot ever be upward sloping, why not?
5. (6) TRUE or FALSE (circle one): Along a convex indifference curve (the usual shape), the marginal value (MRS) of a good rises as the quantity of the good rises.
Please explain your answer.