ECO 401-001
Fall 2004
2nd Test

Name: KEY

ID #: _____

Multiple Choice: 5 points each, circle correct answer.

1. Moe consumes roller coaster rides and other goods. His demand curve for roller coaster rides is a downward-sloping straight line (e.g. P=$5, Q=0; P=$4, Q=1; etc.) When we graph Moe's price-consumption curve for roller coaster rides, it will be:

D
a) Downward sloping
b) A horizontal line
c) Upward sloping
(d) U-shaped

2. The production function for oil pipelines is given by the following equation:
$Q = AH^{0.37}K^{1.73}$
Where Q measures barrels of oil throughput, A is a constant, H is the horsepower of the pump, and K is the diameter of the pipeline. Increasing the diameter of a pipeline while holding other things constant would cause output to increase according to the following formula:

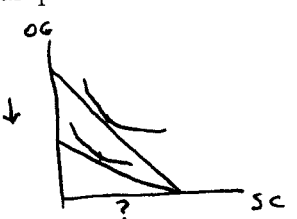
B
a) $.37AH^{-.63}K^{1.73}$
(b) $1.73AH^{0.37}K^{.73}$
c) $AH^{0.37}K^{1.73}/Q$
d) $AH^{0.37}K^{1.73}$

3. Increasing returns to scale may arise for any of the following reasons except:

B
a) Specialization of tasks
(b) High elasticity of substitution between inputs
c) Certain physical (arithmetical) relationships
d) Indivisibilities among inputs

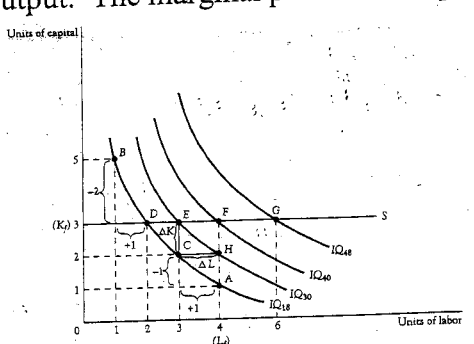
4. Curley's income falls by 50% and simultaneously the price of shaving cream falls by 50%. If Curley only consumes shaving cream and other goods, then we can predict that Curley will consume

A
(a) Less other goods, and either more or less shaving cream
b) More of both shaving cream and other goods
c) Less shaving cream, but more other goods
d) More shaving cream, and either more or less other goods



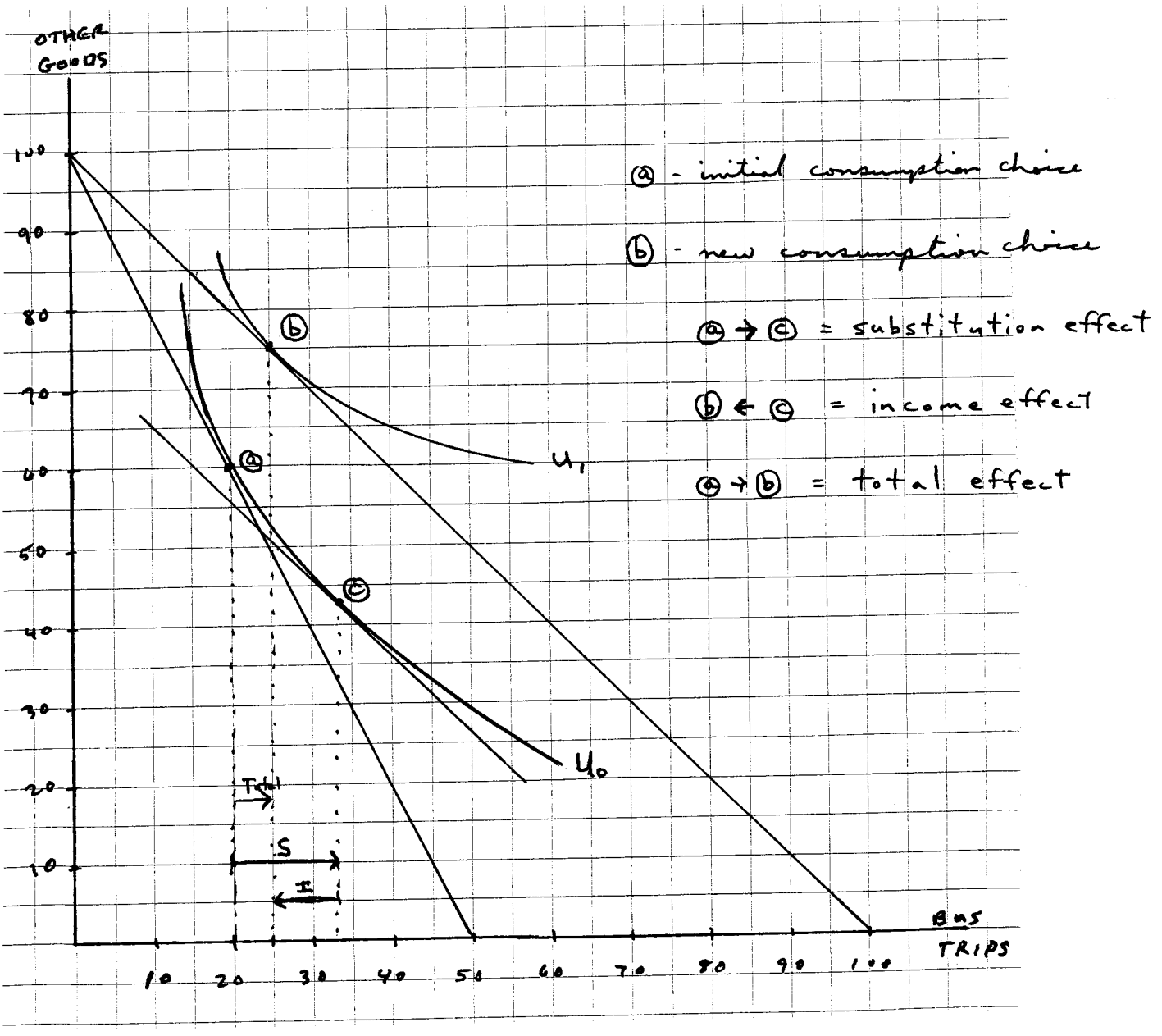
5. Between points B and D in the following diagram, the marginal productivity of a unit of labor is 12 units of output. The marginal product of capital is

B
a) 1
(b) 6
c) 12
d) 24

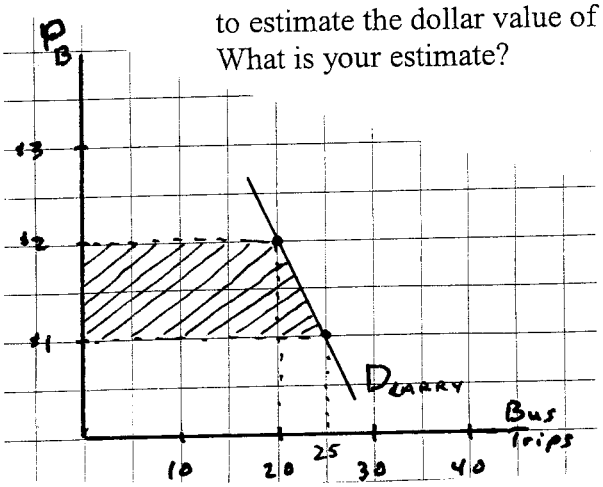


$MRTS_{L,K} = \frac{2}{1} = \frac{MP_L}{MP_K} = \frac{12}{MP_K}$

6. (25 pts.) Larry is a poor college student who consumes two goods, bus transportation and other goods. Larry's weekly income is $100 and the price of a bus trip is $2. The price of other goods is of course $1. At these prices, he purchases 20 bus rides per week. Larry can't wait until he graduates and gets a well-paying job, because he anticipates that he will ride buses a whole lot less often when he can afford alternative transportation.
    a) Illustrate Larry's initial situation in a budget constraint-indifference curve diagram.
    b) Suppose that the city increases taxes and subsidizes the price of a bus ticket so that price falls from $2 to $1. Larry's consumption of bus travel increases from 20 to 25 trips per week. Illustrate Larry's new consumption choice, being careful to show the income and substitution effects of this price change.



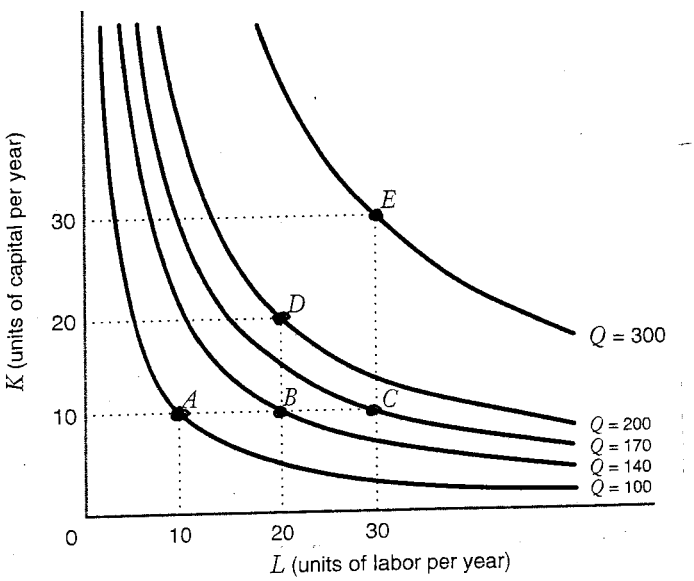
7. (10 pts.) Larry is obviously better off as a result of the decline in the price of a bus ticket, as is evidenced by his ability to reach a higher indifference curve when price falls. Sketch Larry's demand curve for bus travel and then explain how you can use it to estimate the dollar value of the benefit to him of a price reduction from \$2 to \$1. What is your estimate?



The benefit to Larry of a lower price can be measured by the gain in consumer's surplus when price falls from \$2 to \$1. That is equal to the shaded area in the diagram:

$\frac{1}{2} \times 20 \times 1 + 1 \times 5 = \$22.50$

8. (20 pts.) The following diagram contains information on the production of gadgets, which are produced using inputs L and K.
   a) The law of diminishing returns governs short-run production relationships. Do you see evidence of the law of eventually diminishing marginal returns in this diagram? Explain.
   b) Returns to scale is a characteristic of long-run production relationships. What can you infer from the diagram about returns to scale in the production of gadgets? Explain.



(a) diminishing returns - hold K fixed at 10 and increase L from 10 to 20 to 30, i.e. move from A to B to C. Output increases from 100 to 140 to 170, or the marginal productivity of labor falls.

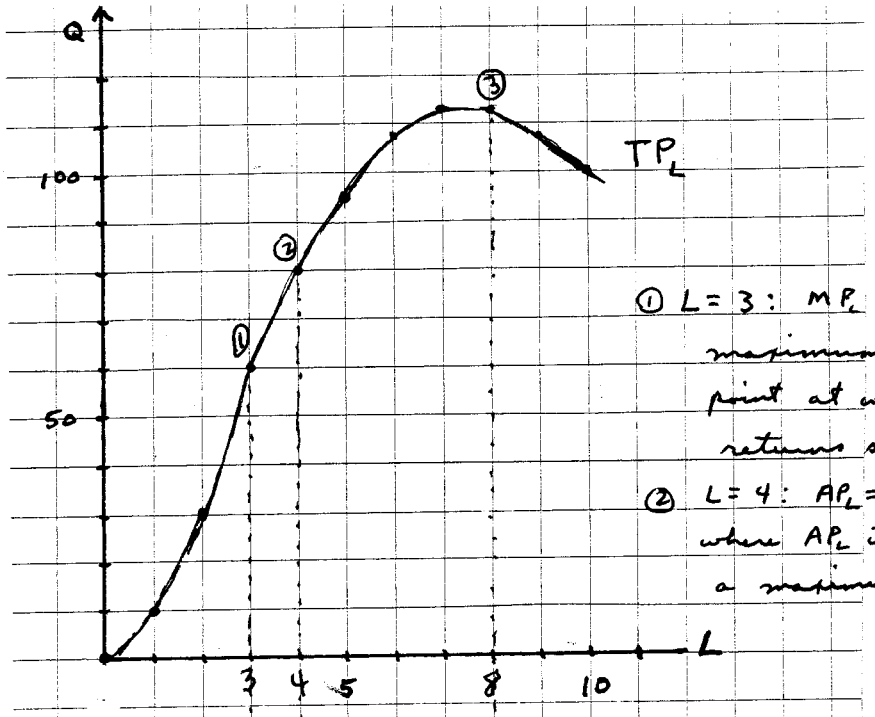
(b) returns to scale - increase all inputs by the same proportion; let L = 10 and K = 10 at point A, then let L = 20 and K = 20 at point B, then let L = 30 and K = 30 at point C. Output increases from 100 to 200 to 300. Since output increases proportionately, there are constant returns to scale.

9. (5 pts.) According to Adam Smith, what steps are involved in making pins?

"One man draws out the wire.
Another straights it,
a third cuts it,
a fourth points it,
a fifth grinds it at the top for receiving the head;
to make the head requires two or three distinct operations...
it is even a trade by itself to put them into the paper."

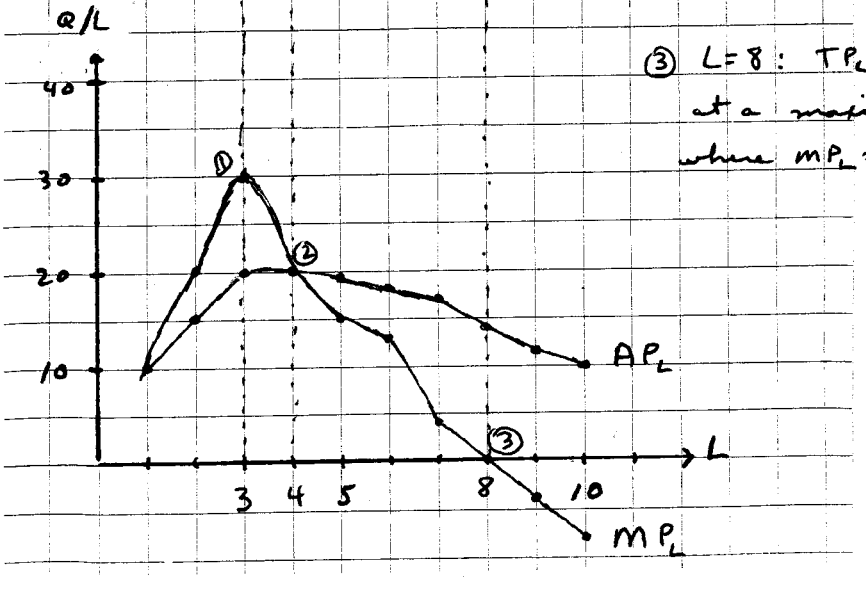
10. (15 pts.) The following table describes the output from your pizza restaurant when K is fixed at 10. On the attached diagrams graph TP_L, AP_L, and MP_L. Briefly explain the critical points in each curve and how one diagram relates to the other.

Amount of Labor (L)	Amount of Capital (K)	Total Output (q)
0	10	0
1	10	10
2	10	30
3	10	60
4	10	80
5	10	95
6	10	108
7	10	112
8	10	112
9	10	108
10	10	100



① L = 3: MP_L is at a maximum, this is the point at which diminishing returns set in.

② L = 4: $AP_L = MP_L$ where AP_L is at a maximum.



③ L = 8: TP_L is at a maximum where $MP_L = 0$.

L	AP_L	MP_L
1	10	10
2	15	20
3	20	30
4	20	20
5	19	15
6	18	13
7	17	4
8	14	0
9	12	-4
10	10	-8