Economics 150a-003, 004 Midterm 2 Solutions, November 2007

	Version 222	**Version 333**	**Version 444**	**Version 555**	**Makeup**
1.	D	B	A	B	D
2.	A	B	B	E	A
3.	E	A	B	C	E
4.	B	A	B	E	B
5.	E	B	A	C	E
6.	C	D	B	D	C
7.	E	A	E	D	E
8.	C	E	C	E	C
9.	D	B	E	A	D
10.	E	E	C	E	E
11.	B	C	D	A	B
12.	B	E	E	B	B
13.	A	C	D	B	A
14.	A	**D**	A	B	
15.	B	E	E	A	

Version 222 #1, Version 333 #6, Version 444 #13, Version 555 #7, Makeup #1

This is perfect complements, so the ray equation is 2L = 3K, so the corner for the isoquant of 120 units, is 60 units of labour and 40 units of capital.

TC = (60 x 10) + (15 x 40)
= 1200

Version 222 #2, Version 333 #7, Version 444 #14, Version 555 #9, Makeup #2

Set MPL/MPK = w/r

$2LK/L^2 = 10/15$

$2K/L = 10/15$

L = 3K, plug into PF

$9000 = L^2 K$

$9000 = (3K)^2 K$

$9000 = 9K^3$

K = 10, L = 30

Version 222 #8, Version 333 #13, Version 444 #10, Version 555 #5, Makeup #8

You can use Cobb-Douglas or do this the long way.

L = 0.5/1 (600/20)
= 15

K = 0.5/1 (600/25)
= 12

Or MPL/MPK = w/r
K/L = 20/25
20 L = 25K

Plug into TC function

20L + 25K = 600
25K + 25K = 600
K = 12, L = 15

Version 222 #14, Version 333 #4, Version 444 #1, Version 555 #11

Solve for the demand for leisure first, using Cobb-Douglas or the long way.

$$R = \frac{1}{2} \frac{(I + w(80))}{w}$$

So L = 80 – R

$$= 80 - \frac{1}{2} \frac{(I + w(80))}{w}$$

The long way is MU R/ MUC = w/1, and plug into the BL.

Version 222 #15, Version 333 #5, Version 444 #2, Version 555 #12, Makeup Prob#4

MPL/MPK, plug into PF

K/L = 40/20
K = 2L

$Q = 4L^{1/2} K^{1/2}$
$Q^2 = 16 LK$
$Q^2 = 16 L (2L)$
$Q^2 = 32 L^2$
$L^2 = Q^2/ 32$
$L = Q/5.66$

Problems

Ricardo went shopping for Hallowe'en candy. Ricardo is just as happy with 2 of the little chocolate bars or 1 bag of mini Doritos. Let ***X*** represent little chocolate bars and let ***Y*** represent Doritos. Ricardo has $15 to spend on Hallowe'en candy. Assume he can purchase part units of both goods.
(14 marks)

A) If the price of little chocolate bars is $0.13 each and the price of Doritos is $0.20, what is Ricardo's initial optimal choice?
(2 marks)

The BL is steeper (0.13/0.20) than the IC (1/2), so Ricardo will buy all Y.

(0, 75) POINT A

B) Now suppose Shoppers Drug Mart has a sale and lowers the price of Doritos to $0.15. What is Ricardo's new optimal choice?
(2 marks)

The BL is still steeper than the IC, so still buy Y.

(0, 100) POINT C

C) Calculate point B on the Hick's line.
(2 marks)

Since we do not switch, there is no sub effect so A = B,
(0, 75)

D) What is the equation to the Hick's line?
(3 marks)

0.13 X + 0.15 Y = 11.25 (calculated by multiplying 0.15 x 75)

E) The Hick's substitution effect on X is _______0______ units. (Make sure you get the signs right. ie. Positive or negative)
(1 mark)

F) The Hick's substitution effect on Y is _______0______units. (Make sure you get the signs right)
(1 mark)

G) The Hick's income effect on X is _____ 0___units. (Again, watch your signs)
(1 mark)

H) The Hick's income effect on Y is ___+25_______ units. (Watch your signs) (1 mark)

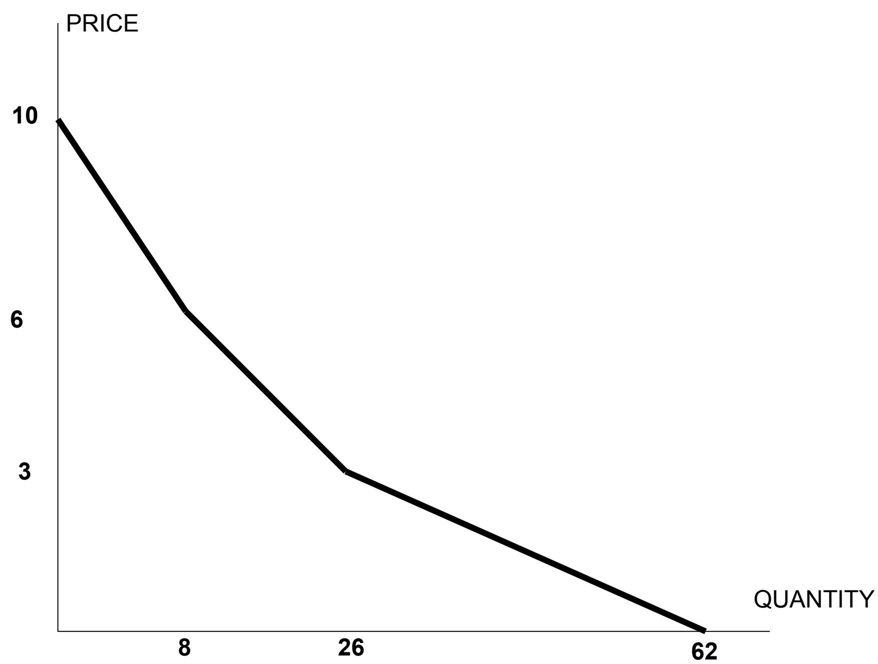
I) What kind of good is Doritos? (1 mark) NORMAL

2. Erin, Nicole and Lindsay each have a demand for navel rings as follows:

Erin: $Q = 20 - 2P$
Nicole: $Q = 18 - 6P$
Lindsay: $Q = 24 - 4P$

Q represents quantity demanded and P represents the price of navel rings.
We will assume that together they constitute the entire demand for navel rings.
(16 marks)

A) Draw the aggregate demand curve in the graph below.
(6 marks)



1 mark each price, 1 mark each quantity. YOU MUST LABEL THE AXES, otherwise, you lose 1 mark.

B) What is the equation for the aggregate demand curve? (6 marks)

$Q = 20 - 2P$ for $P > 6$
$Q = 44 - 6P$ for $3 < P < 6$
$Q = 62 - 12P$ for $P < 3$

1 mark each equation, 1 mark each restriction.

C) Calculate the price elasticity of demand at P = \$2. (2 marks)

$$\varepsilon = \frac{-12\,(2)}{62 - 12\,(2)}$$

$= -24/38 = -0.63$, if miss negative, lose 1 mark

D) What price should the producers of navel rings charge if they want to maximize total revenue? (2 mark)

P = 3.67

Must check middle part of graph, plus bottom part of graph.

Set $\varepsilon = -1$

$$-1 = \frac{-6P}{44 - 6P}$$

P = 3.67, Q = 22, TR = 80.74

$$-1 = \frac{-12P}{62 - 12P}$$

P = 2.58, Q = 31, TR = 80.08

So the P = 3.67 leads to the highest TR.

3. Marilyn is a journalist who is currently working as a junior reporter for a magazine. She receives $20 an hour (including benefits). She has 18 hours a day which she can use for either labour or leisure. Her utility function is ***U (R, C) = R*** ^{2} ***C***, where R represents hours of leisure and C represents dollars spent on consumption goods. Marilyn receives $30 a day in child support.
(13 marks)

A) What is Marilyn's optimal choice in terms of leisure, labour and consumption goods?
(3 marks)

R = ________13_ , C = _______130_________ , L =__5_____

See solutions next page.

B) Marilyn gets a promotion and her wages increase to $25 an hour. What is Marilyn's new optimal choice? (3 marks)

R = ______12.8_____ , C = ______160___ , L = ____5.2___________

C) Calculate point B (the decomposition bundle) on the Hick's line. (4 marks)

R = ___12.07__(1.5 marks)____, C = ____150.85, or 150.88___(1.5 marks)__,
L = __5.93_____(1 mark)______

D) The Hick's substitution effect on leisure is _______-0.93________ units (hours)?
(1 mark)
If sign wrong, lose 0.5 marks

E) The Hick's income effect on leisure is ___+0.73_____________ units (hours)?
(1 mark)

F) What kind of good is leisure? (1 mark) NORMAL, income and sub effects ALWAYS move in opposite directions for leisure.

SOLUTIONS.

This is a Cobb-Douglas utility function so you can solve that way for parts A and B or you can solve the long way.

A) $R = 2/3\ \frac{(30 + 20(18))}{20}$ $\quad$ $C = 1/3\ (390/1) = 130$ or $C = 5 \times 20 + 30$ $(L \times w + I)$

$= 13$

$L = 18 - R = 5$

If you are doing this the long way, you must set MUR/MUC = w/1 and plug into the BL.

$2RC/R^2 = 20/1$
$2C/R = 20/1$
$2C = 20R$
$C = 10R$

BL: $20R + C = 30 + 20(18)$
$20R + 10R = 390$
$30R = 390$
$R = 13, C = 130, L = 5$

B) Again using either method above….

$R = 1/3\ \frac{(30 + 25(18))}{25}$

$= 12.8$

$L = 18 - 12.8 = 5.2$

$C = 1/3\ (480/1)$
$= 160$

Or $C = 25 \times 5.2 + 30 = 160$

If you are doing this the long way, trade-off is now C = 12.5 R, plug into BL

$25R + C = 30 + 25(18)$
$25R + 12.5R = 480$
$R = 12.8, C = 160, L = 5.2$

C) you must use the trade-off in part B, which is $C = 12.5R$ and plug into the utility function.

Utility in part A,

$U = R^2 C$

$= 13^2 \times 130$

$= 21970$

$U = R^2 C$

$21970 = R^2 (12.5R)$

$21970 = 12.5 R^3$

$1757.6 = R^3$

$R = 12.07$ (1.5 marks)

$L = 18 - 12.07 = 5.93$ (1mark)

$C = 12.5R$

$= 12.5 (12.07)$

$= 150.85$ or 150.88 (depending on 2 or more decimals) (1.5 mark)

IF YOU ROUNDED TO LESS THAN 2 DECIMALS YOU LOST 0.5 MARKS. AS STATED IN CLASS, YOU SHOULD ROUND TO NO LESS THAN 2 DECIMALS.