Economics 150a-003, 004 Midterm 2 Solutions, November 2008

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

Version 222 #1, Version 333 #10, Version 444 #9, Version 555 #4, Makeup #1

This is perfect complements, so the ray equation is L = 3K, so the corner for the isoquant of 90 units, is 90 units of labour and 30 units of capital.

TC = (90 x 10) + (15 x 30)
= 1350

Version 222 #2, Version 333 #11, Version 444 #10, Version 555 #6, Makeup #2

This is perfect complements, so the ray is 2X =Y. Plug the ray into the BL, leaving the letters: Px , Py and I.

Px X + PyY= I
PxX + Py (2x) = I
X (Px + 2Py) = I
X = I/(Px + 2Py)

Version 222 #4, Version 333 #1, Version 444 #12, Version 555 #7, Makeup #4

Set MPL/MPK = w/r

10K/10L = 30/120
4K = L, plug into PF

1000 = 10LK
1000 = 10 (4K) K
100 = 4 K^2
K = 5, L = 20

Version 222 #6, Version 333 #3, Version 444 #14, Version 555 #9, Makeup #6

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

L = 2/3 (540/15)
= 24

K = 1/3 (540/10)
= 18

Or MPL/MPK = w/r
$2LK/L^2 = 15/10$
2K/L = 15/10
L = 1.33K

Plug into TC function

15L + 10K = 540
15(1.33K) + 10K = 540
K = 18, L = 24

Version 222 #9, Version 333 #6, Version 444 #5, Version 555 #12
This is perfect subs, isocost is flatter than isoquant, use labour.

Version 222 #14, Version 333 #13, Version 444 #1, Version 555 #2

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

$$R = 1/3 \frac{(I + w(75))}{w}$$

So $L = 75 - R$

$$= 75 - 1/3\ \frac{(I + w(75))}{W}$$

$$= 75 - \frac{I + 75w}{3w}$$

So the statement is FALSE.

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

Version 222 #15, Version 333 #14, Version 444 #2, Version 555 #3

MPL/MPK, plug into PF

$K/L = 20/40$
$L = 2K$

$Q = 10L^{½} K^{½}$
$Q^2 = 100\ LK$
$Q^2 = 100\ (2K)\ K$
$Q^2 = 200\ K^2$
$K^2 = Q^2/200$
$K = Q/14.14$
$L = Q/7.07$

Since some of you chose true and others chose false, I threw out this question.

Problems

1. Rafael is planning a party! He is a student on a limited budget. His favourite snack foods are chips and dip (X) and Nachos and Salsa (Y). He is just as happy with 3 servings of chips and dip or 2 servings of Nachos and Salsa. Rafael has $24 to spend on snacks. Assume he can purchase part units of both goods.
   (17 marks)
   A) If the price of chips and dip is $0.50 a serving and the price of Nachos and Salsa is $0.80 a serving, what is Rafael's initial optimal choice?
      (2 marks)

      The BL is flatter (0.5/0.8) than the IC (2/3), so Rafael will buy all X.

      (48, 0) POINT A

B) Now suppose Loblaws has a sale on Salsa bringing the average price of Nachos and Salsa to $0.60 a serving. What is Rafael's new optimal choice?
(2 marks)

BL is now steeper than IC (0.5/0.6), so he will buy all Y.
(0, 40) POINT C

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

Since perf subs, whatever he buys at C he will also buy at B, therefore he will buy all Y. He must be on the same IC as A (vertical intercept of IC that A is on), so (0, 32) POINT B

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

0.50 X + 0.60 Y = 19.20
Hick's income calculated by multiplying Bundle B by Prices at C.
HI = 0.60 (32) = 19.20

E) The Hick's substitution effect on X is ___-48________ units. (Make sure you get the signs right.
ie. Positive or negative)
(1 mark)

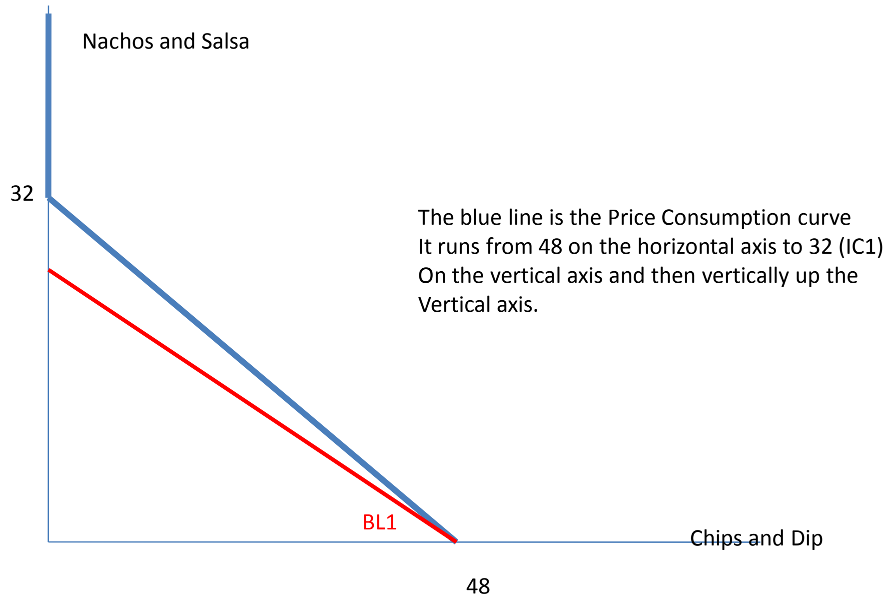
F) The Hick's substitution effect on Y is ____+32_______units. (Make sure you get the signs right)
(1 mark)

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 __+8________ units. (Watch your signs)
(1 mark)

I) What kind of good is Nachos and Salsa? (1 mark) NORMAL

J) Draw the price consumption curve for Nachos and Salsa in the graph below. (3 marks)



0.5 mark: identifying the horizontal intercept of 48, 0.5 mark the vertical intercept of 32, 1 mark shading between them and 1 mark for shading on the vertical axis ABOVE Y = 32. (if you do not label the axes correctly, you will lose 1 mark)

2. The demand for wheat is as follows:

Domestic demand:	$\boldsymbol{Q_{DD} = 1200 - 50P}$
Export Demand from Asia:	$\boldsymbol{Q_{DA} = 2550 - 300P}$
Export demand from the rest of the world:	$\boldsymbol{Q_{DROW} = 1500 - 100P}$

Q represents quantity demanded and ***P*** represents the price of wheat.
We will assume that together they constitute the entire demand for wheat.
(18 marks)

A) Draw the aggregate demand curve in the graph below. (Your graph does not need to be to scale).
(6 marks)

1 mark: vert int = 24, 1 mark: horizontal int = 5250, 2 marks, kink at P =15, Q=450, 1 mark kink at P = 8.5, Q = 1425

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

(1 mark) $Q = 1200 – 50P$ for $P > 15$	(1 mark)
(1 mark) $Q = 2700 – 150 P$ for $15 > P > 8.5$	(1 mark)
(1 mark) $Q = 5250 – 450 P$ for $P < 8.5$	(1 mark)

C) Calculate the price elasticity of demand at P = $10. (2 marks)

$$\varepsilon = \frac{-150\,(10)}{2700 - 150\,(10)}$$

= -1.25

If miss negative sign, lose 1 mark

D) What price should the producers of wheat charge if they want to maximize total revenue? (4 marks)

You should set elasticity for each segment of the AD curve equal to -1. You can skip the first segment as the midpoint is at P = 12, and the restriction is for P > 15.

Segment 2:

Set $\boldsymbol{\varepsilon} = \boldsymbol{-1}$

$$-1 = \frac{-150P}{2700 - 150P}$$

P = 9, Q = 2130, TR = 12150

Segment 3:

$$-1 = \frac{-450P}{5250 - 450P}$$

P = 5.833, Q = 2625, TR = 15311.63

So the P = 5.833 leads to the highest TR.

3. Jackie currently works for a bank in the telephone banking department. 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) = RC***, where ***R*** represents hours of leisure and ***C*** represents dollars spent on consumption goods. Jackie has investment income equal to $25 per day. (11 marks)

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

R = ____9.625___, C = ______192.5_____ , L = ___8.375____

B) Due to the ailing economy, Jackie's employer cuts back her benefits, which effectively reduces her hourly wage to $15 an hour. What is Jackie's new optimal choice?
(3 marks)

R = __9.833____ , C = ___147.5 or 147.5___ , L = ___8.17______

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

R = ___11.11______, C = ___166.65______, L = __6.88_____

D) Which effect is larger, the income effect or the substitution effect?(1 mark)

Sub effect is bigger since from A → C, R ↑ and w ↓

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) $R = 1/2 \left(\frac{25 + 20(18)}{20}\right)$ $C = 1/2\,(385/1) = 192.5$ or $C = 8.375 \times 20 + 25$
(L x w + I)

$= 9.625$

$L = 18 - R = 8.375$

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

$C/R = 20/1$
$C = 20R$

BL: $20R + C = 25 + 20(18)$
$20R + 20R = 385$
$40R = 385$
$R = 9.625,\ C = 192.5,\ L = 8.375$

B) Again using either method above….

$$R = 1/2 \frac{(25 + 15(18))}{15}$$

$= 9.833$

L = 18 – 9.833 = 8.17

C = 1/2 (295/1)
= 147.5

Or C = 15 x 8.17 + 25 = 147.55

If you are doing this the long way, trade-off is now C = 15 R, plug into BL

15R + C = 250 + 15(18)
15R + 15R = 295
R = 9.833, C = 147.5, L = 8.17

C) you must use the trade-off in part B, which is C = 15R and plug into the utility function.

Utility in part A,
U = R C
= 9.625 x 192.5
= 1852.81

U = R C
1852.81 = R (15R)
$1852.81 = 15 R^2$
$123.52 = R^2$
R = 11.11 (1.5 marks)
L = 18 – 12.11 = 6.89 (1mark)

C = 15R
= 15 (11.11)
= 166.65 (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.