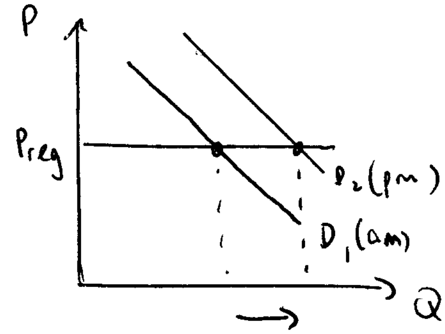
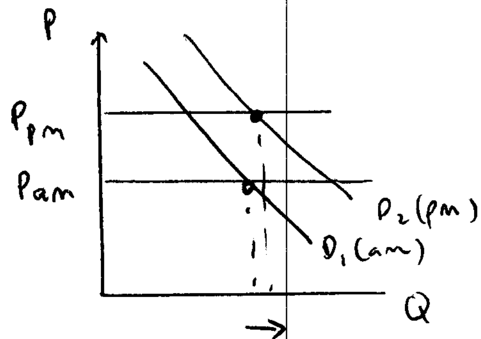
Econ 100 SOLUTIONS TO FINAL EXAM Winter 2001

Version A

1. (a)



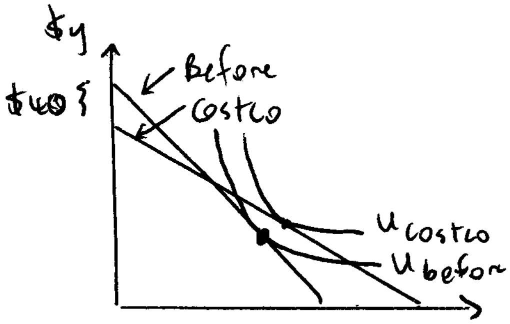
(b)



Less increase in Q than in part (a). Possibly even a decrease

(c) Simplest answer is that here total surplus = consumer surplus (due to horizontal S) and this has fallen due to higher p.m. price. [More complicated answer is that most likely with time of day pricing $P_{am} < P_{reg}$ and $P_{pm} > P_{reg}$ and possibly surplus will rise].

2. (a)

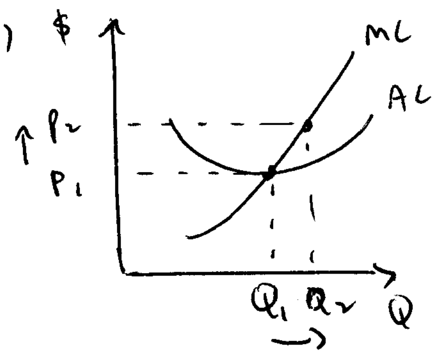


In (a) the budget line has lower y intercept and is flatter.

(b) Different answers are possible. As drawn better off as higher indifference curve.

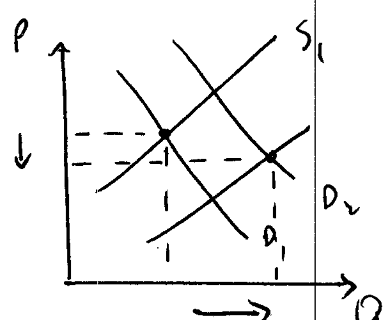
(c) Definitely better off.
10% discount on \$400 equals \$40 which is Costco member fee. So same cost either way, but Costco permits pure substitution effect switch to cheaper food and better off.

3. (a)



Market price ↑ ⇒ Q ↑

(b)



Q ↑ and ultimately P ↓ as decreasing costs industry

(c) Upward sloping. Each firm has upward sloping MC. As industry gets larger firms with higher min AC enter.

Version A (cont.)

4.(a) $MPP_L = \frac{dQ}{dL} = \frac{d}{dL}(5L^{.75}) = 5 \times .75 \times L^{-.25} = 3.75 \times (10{,}000)^{-.25} = \frac{3.75}{10} = .375$

(b) MC = # units labor to produce 1 more table × cost of unit of labor

$= (MPP_L)^{-1} \times \text{wage} = (.375)^{-1} \times 100 = \$266.67$

(c) First get $MRTS_{KL}$

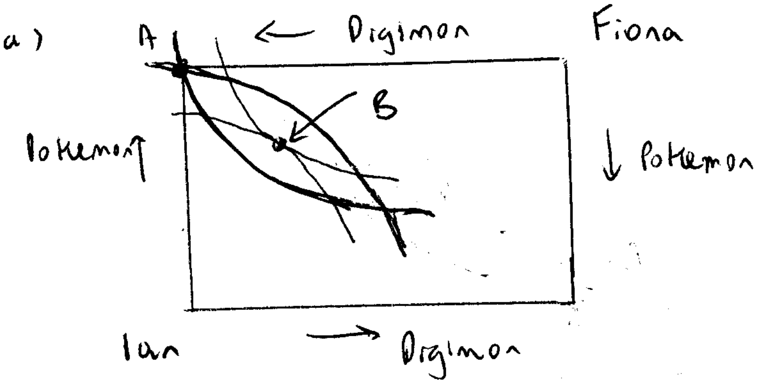
$Q = K^{.25}L^{.75} \Rightarrow Q^4 = KL^3 \Rightarrow K = Q^4/L^3$

So $MRTS_{KL} = -\frac{dK}{dL} = 3\,Q^4/L^4 = 3\left(\frac{Q}{L}\right)^4 = 3\left(\frac{5{,}000}{10{,}000}\right)^4 = 3/16$

Also $P_L/P_K = 100/300 = 1/3$. Mix is not optimal since $MRTS_{KL} \neq P_L/P_K$

5. Note. Different answers possible due to different origin (Ian or Fiona).

(a)



(a) Initial allocation is A.

(b) Pareto efficient allocation is B, for example
Tangency and both better off.

(c) MRS_{PD} needs to be equated.

It equals $100/D^2$ for Ian and $25/D^2$ for Fiona.

Then $100/D^2_{IAN} = 25/D^2_{FIONA} \Rightarrow D^2_{IAN} = \frac{100}{25} \times D^2_{FIONA} \Rightarrow D_{IAN} = 2 \times D_{FIONA}$

Ian will have twice as many Digimon.

6.(a) Only way to make one person better off is to make someone else worse off.

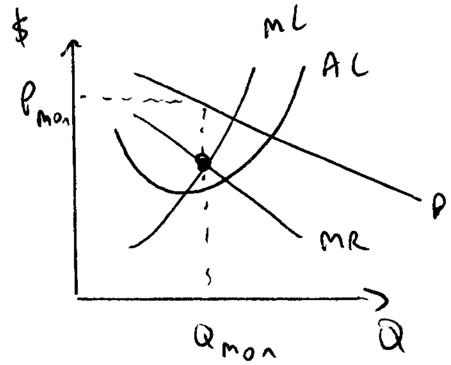
(b) Each consumer sets $MRS_{XY} = P_X/P_Y$.

Since they each face the same P_X & P_Y, it must be that MRS_{XY} are equal.

(c) No. Pareto efficiency does not imply equity, and government is also concerned about equity.

Version A (cont.)

7.(a)



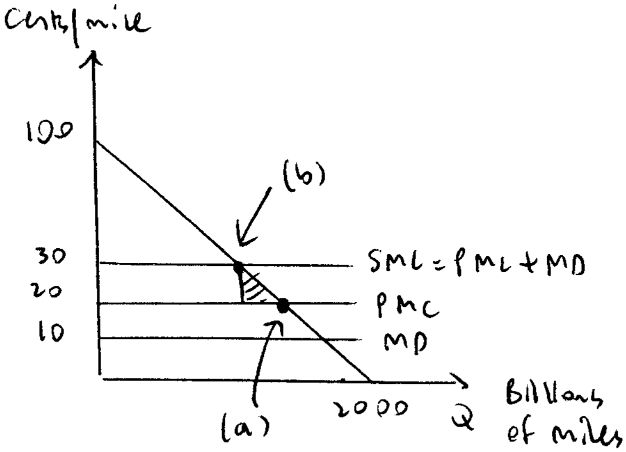
(b) $\varepsilon = -\%\Delta Q / \%\Delta P$

$> -\frac{5}{37} = \underline{\underline{-.14}}$

Price elasticity is $-.14$ (or even less)

(c) Probably not. MC is close to zero. So should MR be close to zero. But here revenue increased by 32% as prices rose. Should jack prices up even more.

8.



Since $Q = 2000 - 20P$

we have $P = 100 - \frac{1}{20}Q$

(a) $100 - \frac{1}{20}Q = 20$

$\Rightarrow Q = \underline{\underline{1600}}$ Billion miles

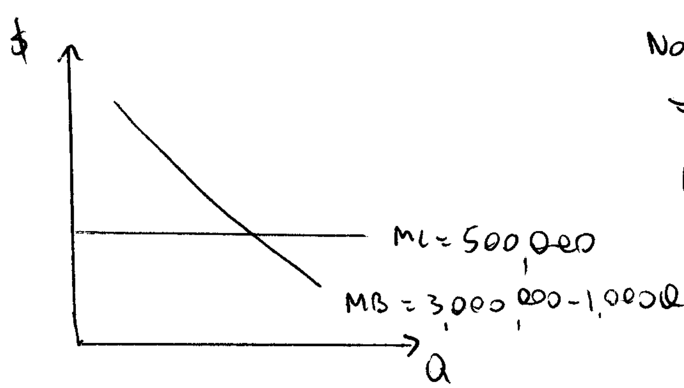
(b) $100 - \frac{1}{20}Q = 30$

$\Rightarrow Q = \underline{\underline{1400}}$ Billion miles

(c) Loss is the shaded area

$= \frac{1}{2} \times (1600 - 1400) \times (30 - 20) = \frac{1}{2} \times 200 \times 10 = 1{,}000$ bill cents $= \$10$ billion

9.(a)



Note that $TC = 500{,}000 \times Q$

$\Rightarrow MC = 500{,}000$

(b) $MB = MC$

$\Rightarrow 4{,}000{,}000 - 1{,}000Q = 500{,}000$

$\Rightarrow 1{,}000Q = 3{,}500{,}000$

$\Rightarrow Q = \underline{\underline{3{,}500}}$ beds

(c) No. Consumption here is rival. One person's use of a hospital bed prevents another from using it.

[Or can say that ~~xx~~ it is excludable so could be privately provided].

Version B

Q1 - Q3 Same as version A

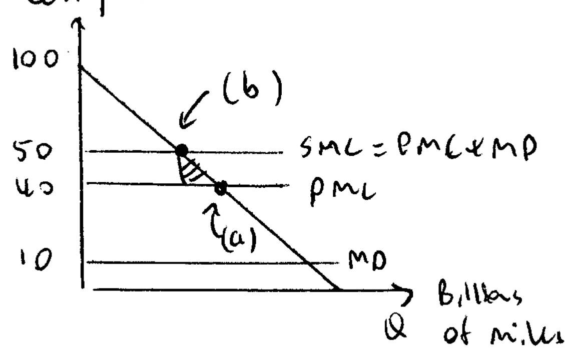
Q4 (a) $MPP_L = \frac{dQ}{dL} = \frac{d}{dL}(5L^{.75}) = 5 \times .75 \times L^{-.25} = 3.75 \times (10{,}000)^{-.25} = \frac{3.75}{10} = .375$

(b) MC = # units to produce 1 more table × cost of unit of labor
$= (MPP_L)^{-1} \times \text{wage} = (.375)^{-1} \times 200 = \underline{\$533.33}$.

(c) First get $MRTS_{KL}$
$Q = K^{.25}L^{.75} \Rightarrow Q^4 = KL^3 \Rightarrow K = Q^4/L^3$
So $MRTS_{KL} = -dK/dL = 3Q^4/L^4 = 3(Q/L)^4 = 3\left(\frac{5000}{10{,}000}\right)^4 = 3/16$
Also $P_L/P_K = 200/500 = 2/5$. Mix is <u>not optimal</u> since $MRTS_{KL} \neq 3/16$.

Q5 - Q7 same as version A

Q8



Since $Q = 2000 - 20P$
we have $P = 100 - \frac{1}{20}Q$

(a) $100 - \frac{1}{20}Q = 40$
$\Rightarrow Q = \underline{1200}$ Billion miles

(b) $100 - \frac{1}{20}Q = 50$
$\Rightarrow Q = \underline{1000}$ Billion miles

(c) Loss is the shaded area
$= \frac{1}{2} \times (1200 - 1000) \times (50 - 40) = \frac{1}{2} \times 200 \times 10 = 1{,}000$ bill cents $= \$10$ billion

Q9 Same

Mult. Choice Question	1	2	3	4	5	6	7	8	9	10	11	12	13
Version A	d	b	b	c	c	b	a	c	c	d	c	a	b
Version B	b	a	a	c	d	a	b	c	a	d	d	b	c

Out of 80

75th percentile	58
Median	49
25th percentile	38

Grade on Exam

A	64 or better
A-	60 " "
B+	57 " "
B	53 " "
B-	50 " "
C+	47 or better
C	43 " "
C-	40 " "
D+	37 " "
D	34 " "
D-	31 " "