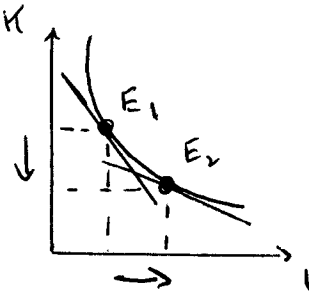
100 SOLUTIONS TO SECOND MIDTERM EXAM Winter 02

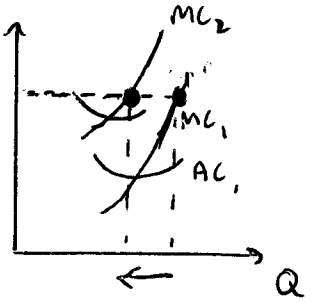
Version A

1. (a) (i) Substitution: savings ↑ as relative price of consumption today up so consume ↓

(ii) Income: savings ↓ as now wealthier so consume more today and save less.

(b) 

Isocost flattens as $\frac{P_L}{P_K}$ ↓ when P_K ↑
Move from $E_1 \to E_2$
So K ↓ and L ↑

(c) 

MC curve shifts up and left from MC_1 to MC_2
So Q ↓ for given P

2. (a) $10{,}000 = 100 \times K^{.5} L^{.5} \Rightarrow 100 = K^{.5} L^{.5} \Rightarrow K^{.5} = \frac{100}{L^{.5}} \Rightarrow K = \frac{10{,}000}{L}$

(b) $MRTS_{KL} = -\frac{dK}{dL} = -\frac{d}{dL}\left(\frac{10{,}000}{L}\right) = \frac{10{,}000}{L^2}$

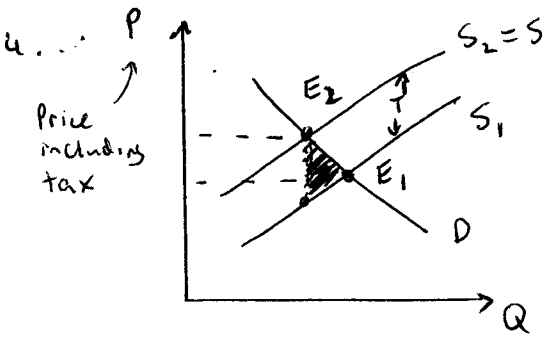
(c) $MRTS_{KL} = \frac{P_L}{P_K} \Rightarrow \frac{10{,}000}{L^2} = \frac{1{,}000}{16{,}000} \Rightarrow L^2 = 160{,}000 \Rightarrow L = 400$

$\Rightarrow K = \frac{10{,}000}{400} = 25$

3. (a) $MC = \frac{dVC}{dQ} = 1 + 0.02Q$ Supply curve is $P = 1 + 0.02Q$

(b) At profit max $MC = P \Rightarrow 1 + 0.02Q = 2 \Rightarrow 0.02Q = 1 \Rightarrow Q = 50$ cups

(c) Profit in short-run ignoring fixed costs = Rev − VC = $2 \times 50 - (50 + 0.01 \times 50^2) = \$25$

4. 

(a) As in diagram supply curve shifts up vertically by T, the amount of the tax
Price including tax ↑ and Q ↓

(b) As drawn P ↑ less than tax
So both bear burden.
For my diagram mostly consumer as P ↑ by about $\frac{2}{3}$ of the tax.
But could be the other way for other diagrams.

(c) Shaded region gives the welfare loss
(= loss in total surplus − gain in govt. rev.)

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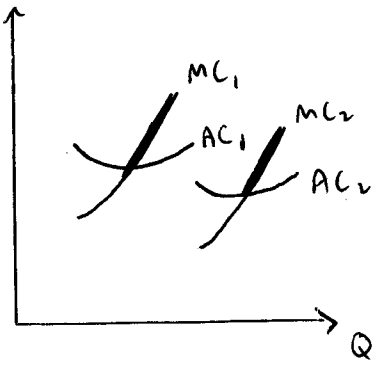
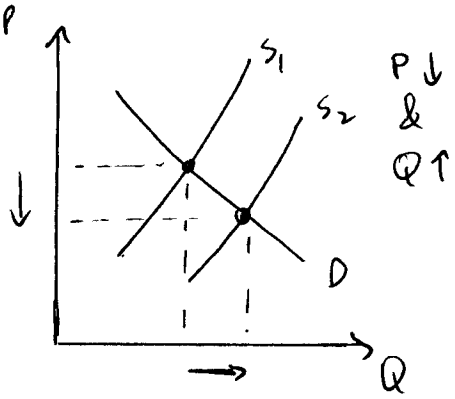
Version A (cont.)

5.(a)



Supply curve shifts out from MC_1 above min AC_1 to MC_2 above min AC_2

(b)



(c) Most likely P ↓ more than min AC ↓

So grocery stores now make loss and some will exit.

Version B

1., 2., 4., 5. see version A

3.(a) $MC = \frac{dVC}{dQ} = 1 + 0.04Q$ Supply curve is $P = 1 + 0.04Q$

(b) At profit max $MC = P \Rightarrow 1 + 0.04Q = 2 \Rightarrow 0.04Q = 1 \Rightarrow Q = 25$ cups

(c) Profit in short-run ignoring fixed costs $= Rev - VC = 2 \times 25 - (25 + 0.02 \cdot 25^2) = \$12.50$

Multiple Choice

Ques	Version A	Version B
1	c	c
2	a	b
3	c	b
4	b	a
5	d	d

{ $w\uparrow \Rightarrow$ sub. effect work ↑ as leisure more expensive; income effect work ↓ as higher income so more leisure

$MRP_L = \frac{\Delta Rev}{\Delta L} = \begin{cases} 5 \times \$25 & \text{Version A} \\ 4 \times \$25 & \text{Version B} \end{cases}$

Add up the powers. Increasing if > 1 & decreasing if < 1

Scores out of 40

75th percentile	31
Median	28
25th percentile	26

Grading Guide [Course curve is based on total points]

A+, A or A-	32 & above
B+, B or B-	28 " "
C+, C or C-	24 " "
D+, D or D-	20 " "

For midterm 1 the grading guide is

A- or better	31 & above
B- " "	27 " "
C- " "	23 " "
D- " "	19 " "