1. (a) (i) Substitution: \( \text{savings} \uparrow \) as relative price of consumption today up so consume less.
   (ii) Income: \( \text{savings} \downarrow \) as now wealthier so consume more today and save less.

(b) \( K \)

(c) \( MC \)

2. (a) \( 10,000 = 100 \cdot K^{-5} \cdot L^{-5} \Rightarrow 100 = K^{-5} \cdot L^{-5} \Rightarrow K = 1 \cdot 10000 \)
   (b) \( MR\!TS\!K_L = -\frac{dK}{dL} = - \frac{1}{L} \left( \frac{10,000}{L^5} \right) = \frac{-10,000}{L^6} \)
   (c) \( MR\!TS\!K_L = \frac{PL}{PK} \Rightarrow \frac{10,000}{100} = \frac{1,000}{100} \Rightarrow L = 100,000 \Rightarrow L = \frac{100,000}{25} \Rightarrow K = \frac{10000}{25} \)

3. (a) \( MC = \frac{dK}{dQ} = 1 + 0.02Q \)  
   Supply curve \( p = 1 + 0.02Q \)
   (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 = \( \text{Rev} - \text{VC} = 2 \times 50 - (50 + 0.01 \times 50) = \$25 \)

4. (a) As in diagram supply curve shifts up vertically by \( \gamma \), the amount of the tax
   Price including tax \( \uparrow \) and \( Q \downarrow \)
   (b) As drawn \( P \uparrow \) less than tax
   So both bear burden.
   For my diagram mostly consumer as \( P \uparrow \) by about \( \frac{\gamma}{2} \) of the tax.
   But could be the other way for others diagrams.
   (c) Shaded region gives the welfare loss
   \( = \text{loss in total surplus - gain in govt. rev.} \)
1. MC: WO2

Version A (Cont.)

5. (a) $\frac{MC_1}{MC_2}$

Supply curve shifts out from MC, above min AC; to MC below min AC.

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

So grocery stores need make less and some will exit.

Version B

1, 2, 3, 4, 5. See Version A

30. (c) $MC = \frac{dVC}{dQ} = 1 + 0.04Q$

Supply curve: $P = 1 + 0.04Q$

(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 $\text{Rev} - VC = 2 \times 25 - (25 + 0.02 \times 25) = \$12.50$

Multiple Choice

<table>
<thead>
<tr>
<th>Ques</th>
<th>Version A</th>
<th>Version B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>c</td>
<td>c</td>
</tr>
<tr>
<td>2</td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td>3</td>
<td>c</td>
<td>b</td>
</tr>
<tr>
<td>4</td>
<td>b</td>
<td>a</td>
</tr>
<tr>
<td>5</td>
<td>d</td>
<td>d</td>
</tr>
</tbody>
</table>

Scores out of 40

75th percentile 31
Median 28
25th percentile 26

Grading Guide

A+: $32$ & above
A: $28$ & above
B+: $26$ & above
B: $24$ & above
C+: $22$ & above
C: $20$ & above
D+: $18$ & above
D: $16$ & above

For midterm 1 the grading guide is

A: $31$ & above
B: $27$ & above
C: $23$ & above
D: $19$ & above