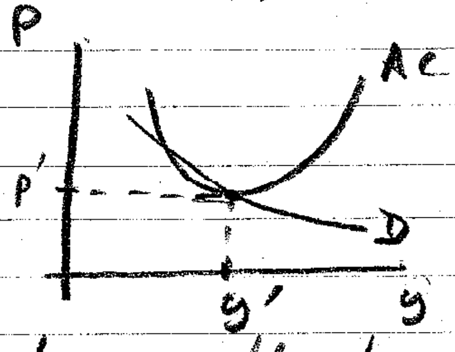
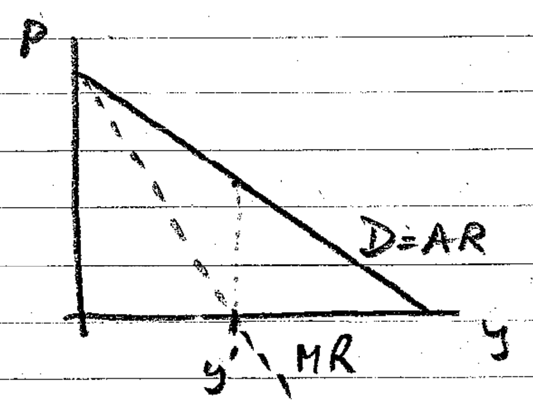
SOLUTIONS

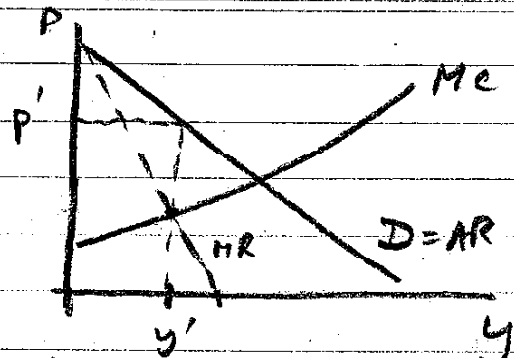
1. Define Monopolistic Competition. Specifically, there are many firms, facing downwards-sloping demand curves, selling close substitutes. The minimum point of the AC curve, as shown, would not be chosen, since at lower output the firm's profit would be higher, since P > AC. In the limit at equilibrium, the firm would choose to operate where $\pi = 0$ but a maximum, when the Demand curve (downwards sloping) is tangential to the AC curve. TRUE.



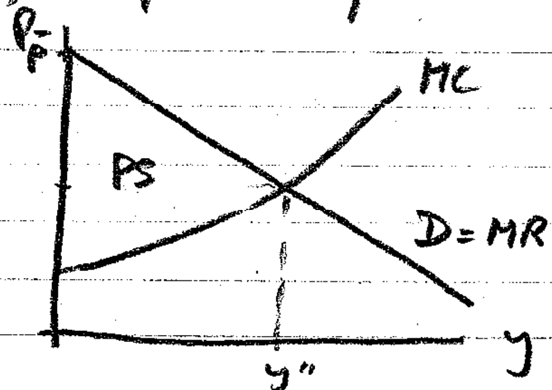
2. Define monopoly and revenue. For a linear demand curve, the MR curve is as shown (for uniform pricing). Revenue is a maximum when MR = 0 (see the Table in Lecture 17, page 2), which occurs at unitary elasticity. To maximise profit π, the firm chooses output y where $MR(y) = MC(y)$. The lowest possible MC is zero, so the highest possible, profit-maximising y is where $MR(y) = 0$ at y' where Revenue is maximised. If $MC > 0$, then y^* will be less than y'. TRUE.



3. With uniform pricing, any profit-maximizing firm choose output where $MR(y^*) = MC(y^*)$.



For a firm facing a downwards-sloping demand curve (a firm with market power) and with a single price (no discrimination), the firm will produce y' and sell at P'.



If however it can practice perfect price discrimination, then the D curve becomes the MR curve, and the firm produces y'' output, selling each unit at the maximum it can along the demand curve ($y=1$ at $\bar{P}$, $y=2$ at a slightly lower price, etc.) It will produce more than under uniform (single) pricing: $y'' > y'$. TRUE.

4. 14¢/litre in 1978 CPI 60.5 1978
70¢/litre in 1997 162.8 1997

Petrol prices have risen by $70/14 = 500\%$.
Overall prices have risen by $162.8/60.5 = 269\%$.
∴ TRUE, the real price of petrol has risen.

The equivalent (real) price of petrol in 1997 if the price was 14¢/litre in 1978

$$= 14 \times \frac{162.8}{60.5} = 37.7 ¢/\text{litre} < 70¢.$$

TRUE

5. The cost of the two plans will differ depending on the intensity of usage. What is the level of usage (in rentals per year) at which the two plans cost the same?

Let x = number of rentals/year.

Plan A : $C_A = 40 + 2x$

Plan B: $C_B = 4x$

$C_A = C_B$ when $x = 20$ rentals/year.

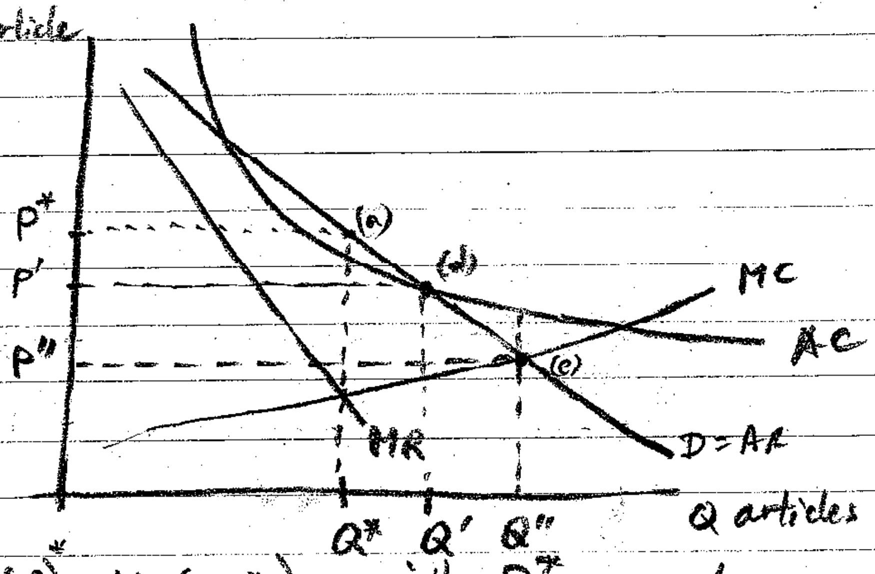
If $x > 20$, then $C_B > C_A$.

If $x < 20$, then $C_B < C_A$.

The logic is to offer a choice, depending on the consumer's expected usage, to capture more of the CS. If expected $x \leq 20$/year, then pay \$4 a rental (B), but if expected $x > 20$/year, then sign up for plan A; the video store gets \$40 even if you end up only renting 15.

Possible to offer a plan C, with, say, an annual charge of \$100 and a per-rental charge of only \$1.

6.



(a) $MR(Q^*) = MC(Q^*)$, with P^* as shown, and positive π, because $AR > AC$ at Q^*.

$P^* = 60¢$/article, $Q^* = 2.7$m articles/day

(b) Yes, since AC is falling over the region of demand, it seems that the P.O. has high Fixed Costs.

(c) As a monopoly, it would produce at Q^* and sell at P^*. Traditionally, post offices have been government owned (as have water, sewerage, and other "utilities").
But not necessarily.
Regulation could force higher output, lower price, and lower profit, so long as a normal return to capital is achieved.

(d) At breakeven, the P.O. will operate at the level of output Q' where $AR(Q') = AC(Q')$
$Q' = 4$m articles/day, $P' = 30$¢/article

(e) The socially efficient level would be where $P'' = MC(Q'')$ as shown.
$Q'' = 4.3$m articles/day, $P'' = 25$¢/article.
Unfortunately, the P.O. would go out of business, since $AC(4.3) > 25$¢, and $\pi'' < 0$.

So a natural monopoly can not operate at the social efficient level without a subsidy.

7.

Q	D	AVC	TR	TVC	FC+Profit	MC	MR
0	$16	–	0	0	0	0	-
1	15	$1	1500	100	1400	100	1500
2	14	2	2800	400	2400	300	1300
3	13	3	3900	900	3000	500	1100
4	12	4	4800	1600	3200	700	900
5	11	5	5500	2500	3000	900	700
6	10	6	6000	3600	2400	1100	500
7	9	7	6300	4900	1400	1300	300

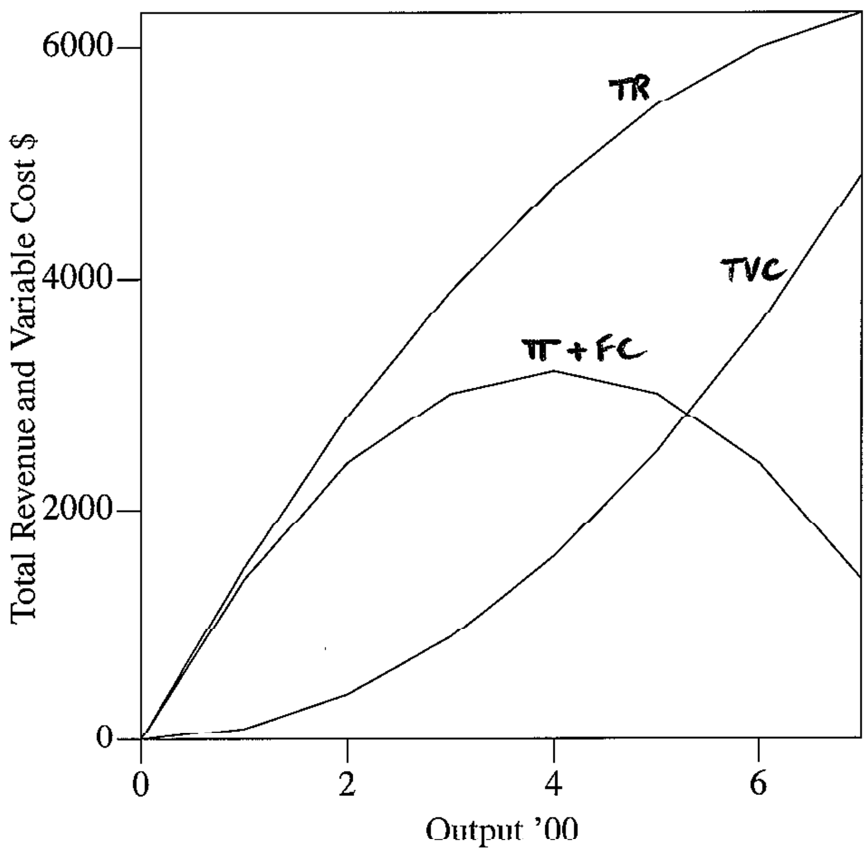
(a) Since it faces a downwards-sloping demand curve (as seen by the first two columns), it has market power – it can raise its price, say, from $10 to $11 without losing all its sales.

(b) See above.

(c)(d) See below

(e) From the graphs and the table, its short run profit is maximised when Q = 4000 @ price $12/unit. Its profit is $3200. At this output Q,
MR(4000) is between $900 and $700 } equal.
MC(4000) is between $700 and $900 }

(f) Depends on the FC. In the short run, TR = $4800 > TVC = $1600, so do not shut down.
In the long run, are FC > $3200? If so, then this level of profit is unsustainable, so shut down.


6000
4000
2000
0
Total Revenue and Variable Cost $
TR
TVC
π + FC
0
2
4
6
Output '00