ECO 135 (1) HW Answers ch 8. 2, 6, 7, 8, 10.

2. ○ FC = 30 million

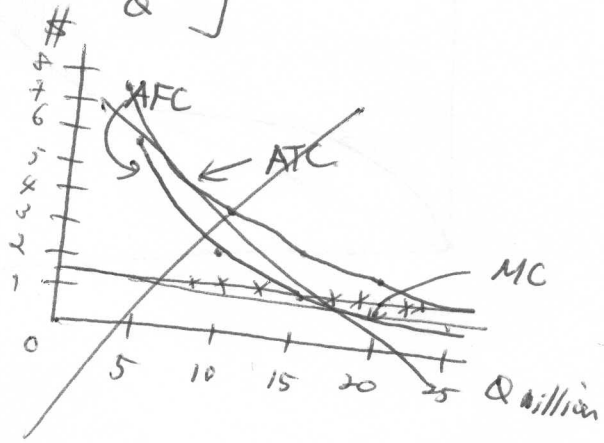
$$\begin{cases} AFC(Q=5mil) = \frac{FC}{Q} = \frac{30mil}{5mil} = \#6. \\ AFC(Q=10mil) = \frac{30mil}{10mil} = \#3 \\ AFC(Q=20mil) = \frac{30mil}{20mil} = \#1.5. \end{cases}$$

○ MC = #1.50 for 0 ~ 40 mil copies

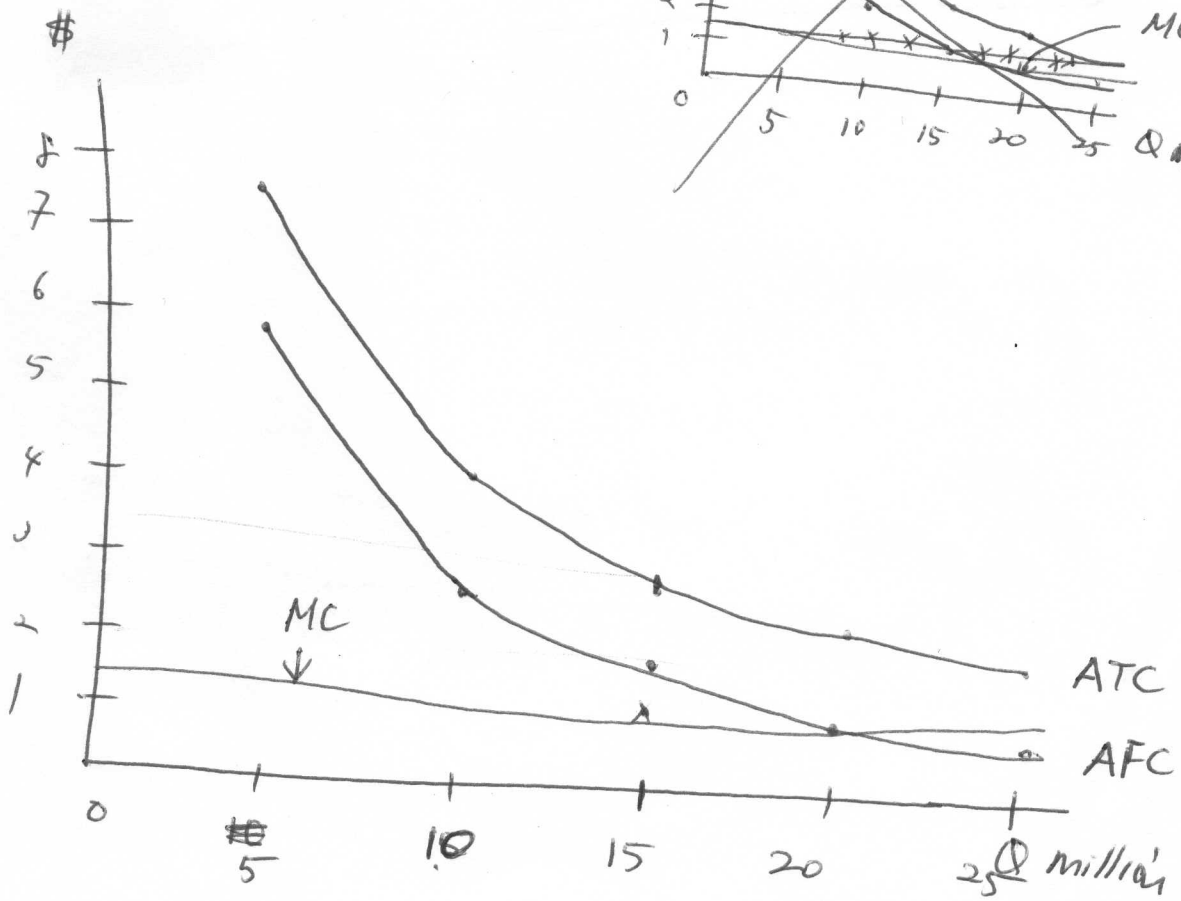
If each book costs #1.50, and that is true for every book up to 40 million, then the average variable cost of a volume is #1.50 regardless of how many volumes come off the press, at least up to 40 million copies.

○ ATC = AFC + AVC $\left[\leftarrow \frac{TC}{Q} = \frac{FC}{Q} + \frac{VC}{Q}\right]$

ATC(Q=5mil) = 6 + 1.50 = #7.50
ATC(Q=10mil) = 3 + 1.50 = 4.50
ATC(Q=20mil) = 1.5 + 1.5 = 3



8.



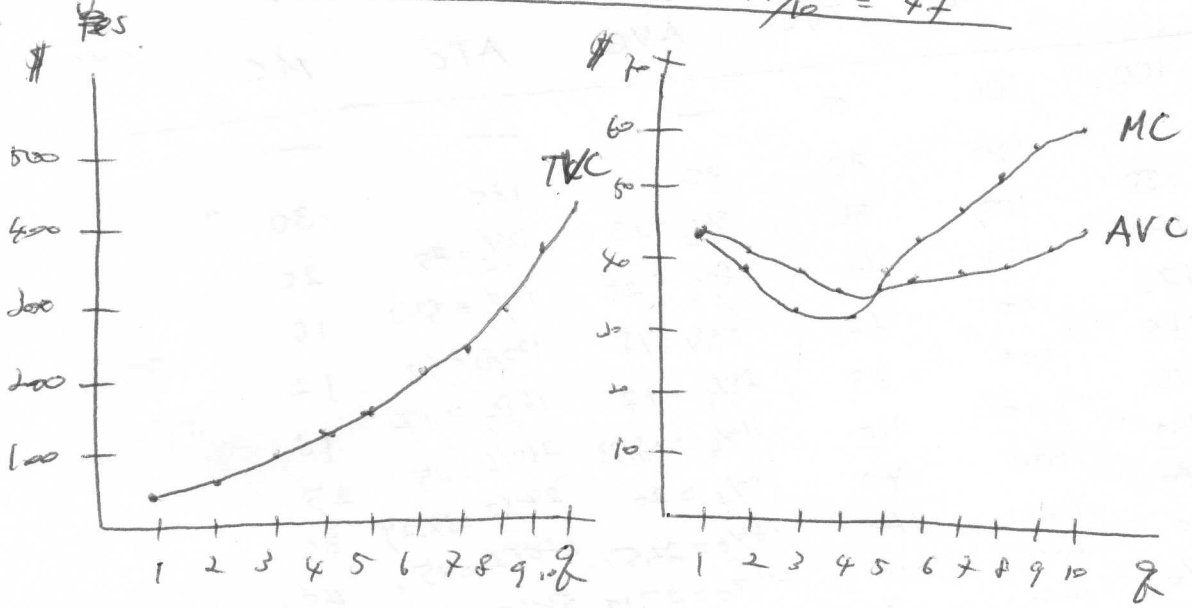
6. $P_K = 10, P_L = 5$

Since the cost varies w/ output level, this is total variable cost.

a.

Q	K	L	TC	MC	AVC
0	0	0	0	–	
1	2	5	20 + 25 = 45	45	45/1 = 45
2	4	9	40 + 45 = 85	40	85/2 = 42.5
3	6	12	60 + 60 = 120	35	120/3 = 40
4	8	15	80 + 75 = 155	35	155/4 = 38.75
5	10	19	100 + 95 = 195	40	195/5 = 39
6	12	24	120 + 120 = 240	45	240/6 = 40
7	14	30	140 + 150 = 290	50	290/7 = 41.43
8	16	37	160 + 185 = 345	55	345/8 = 43.13
9	18	45	180 + 225 = 405	60	405/9 = 45
10	20	54	200 + 270 = 470	65	470/10 = 47

b.



b). Yes, given diminishing returns, MC may fall at first but should eventually rise with output.

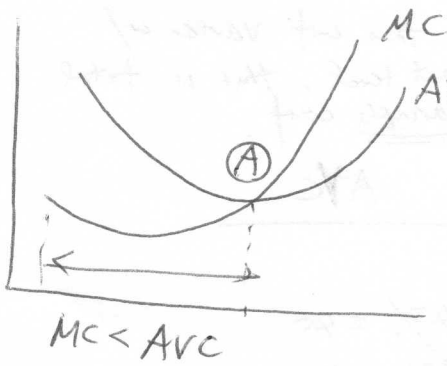
c). When MC is below AVC, AVC falls. When MC is above AVC, AVC rises.

d) Marginal cost is the added cost of the resources needed to increase output one unit. The MC of the 8th unit of output, for example, is $45; 2 units of K at $10 each and 5 units of L at $5 each.

e). $P = \$57$

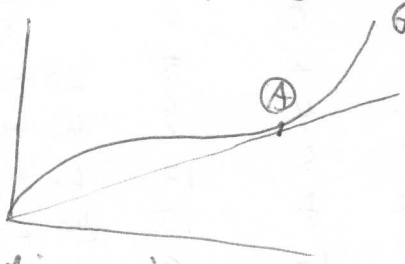
The firm would increase production as long as $P > MC$. The optimal level of output would be 8.

7. a.



Agree

Upto point A, TVC is increasing at decreasing rate → AVC is decreasing upto A.



b. Disagree. It should be for any perfectly competitive firms who are the price-takers.

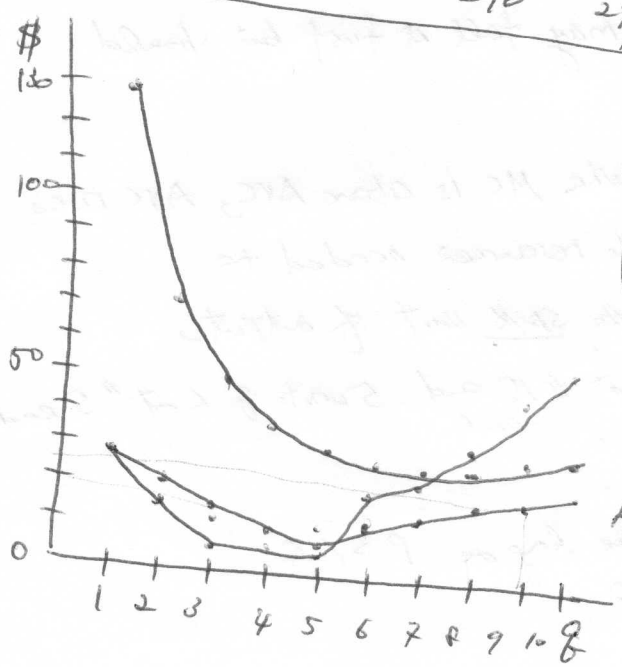
c. Disagree. Firms do not have control over fixed costs in the short run. They do in the long run.

8.

a.

Q	TC	TFC	TVC	AVC	ATC	MC
0	100	100	0	—	—	—
1	130	100	30	30	130	30
2	150	100	50	50/2 = 25	150/2 = 75	20
3	160	100	60	60/3 = 20	160/3 = 53.3	10
4	172	100	72	72/4 = 18	172/4 = 43	12
5	185	100	85	85/5 = 17	185/5 = 37	13
6	210	100	110	110/6 = 18.33	210/6 = 35	25
7	240	100	140	140/7 = 20	240/7 = 34.29	30
8	280	100	180	180/8 = 22.5	280/8 = 35	40
9	330	100	230	230/9 = 25.56	330/9 = 36.67	50
10	390	100	290	290/10 = 29	390/10 = 39	60

b.



When MC is below ATC, ATC is decreasing
When MC is below AVC, AVC "
When MC is above ATC, ATC is increasing
When MC is above AVC, AVC "

c. P = 30 P = MC = 30 at Q = 7.
Produce 7 units
TR = 7 * 30 = $210.
TC = 240
Π = TR − TC = 210 − 240 = −30 losing money

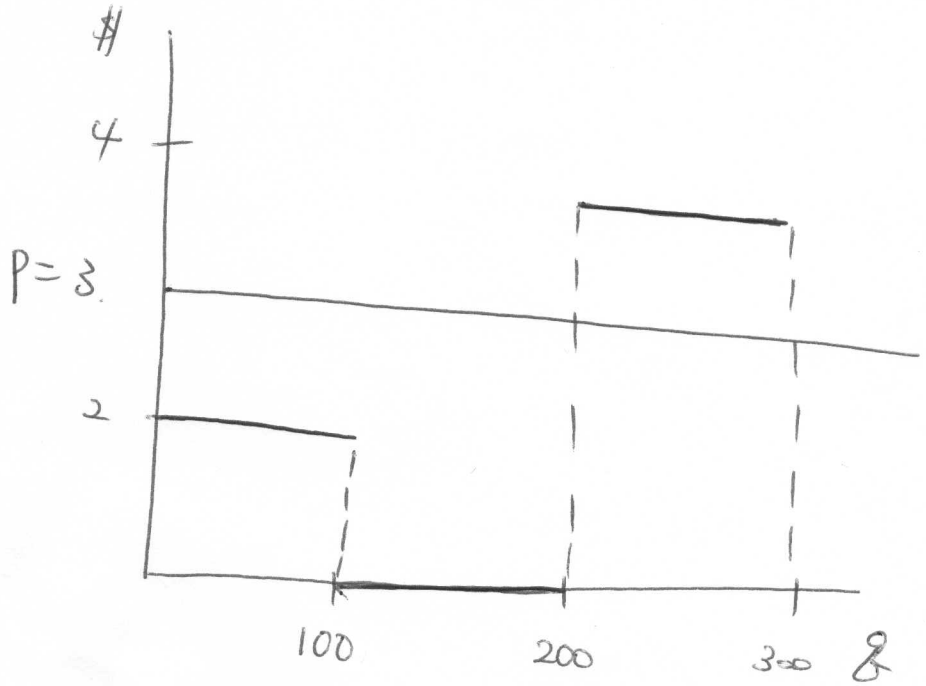
d. P = 50, P = MC = 50 at Q = 9.
TR = 9 * 50 = 450, TC = 330
Π = TR − TC = 450 − 330 = $120

ch.8

10. (4)

MC = slope of TC at each q.

q	MC
0 – 100	2 (= 200/100)
101 – 200	0 (= 0/100)
201 – 300	4 (= 400/100)



If P=3, the optimal q is 200 because the firm produces as long as P > MC.

At q > 200, MC > P, therefore, if the firm produces more than 200 units, they start reducing their profit.