# Econ 101: Managerial Economics
## *Solutions to the Final Practice Problems*

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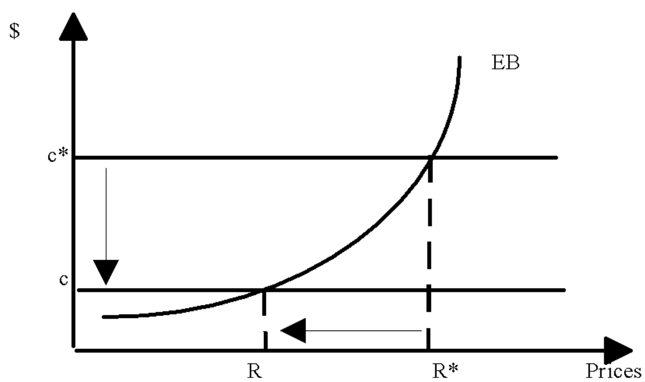
## Part I

1. Specialized inputs required; Long-term contracts **hard** to write. **No** spot market.
2. Price discrimination is not necessarily evil. It can make an industry viable when, absent price discrimination, fixed costs are prohibitive. It is mainly constrained by inability to detect willingness to pay and by arbitrage. Still, ethics and law can also constraint price discrimination.
3. No hold-up since gas is sold on the spot market, and most drivers can find alternative gas stations if own overcharges.
4. True, according to the standard search model.




5. Both refer to pricing below MC but predation is to bankrupt competitors, while penetration is to attain critical mass.

## Part II

a) Facebook might subsidize. Facebook traffic might hog less bandwidth. There might be a cross subsidy to gain customers.

b) Yes, it has elements of market segmentation, and also 2 part pricing.

c) Lots of new choices with different explicit or implicit prices for: speed (bandwidth), total traffic, incoming vs outgoing traffic, per day max etc. The new menus help your carrier to better price discriminate and to peak load price.

# Part III

1. a) Yes, if MC is the same everywhere, then price difference indicates price discrimination.

b) Markup for US is $\frac{51}{10} = \frac{P}{MC} = \frac{E}{1+E} \implies 51(1+E) = 10E$

$E = -\frac{51}{41} \approx -1.24$.

2. #2

| | | H | L |
|---|---|---|---|
| #1 | H | 10,10 | 1,15 |
| | L | 15,1 | 5,5 |

$L$ is dominant strategy for both firms, hence $NE$ is $(L, L)$, unique in 1-shot game.

b) Grim trigger strategy (H until anyone chooses L, then L ever after) sustains (H,H) as a NE of the repeated game as long as discount factor $\delta$ gives (10,10,...) a higher PV than (15,5,5,5....). By the usual calculation, the condition is $\delta \geq \frac{1}{2}$.

c) Solving the tree, we see that the unique subgame perfect NE is (L,l) w/payoff (5,5). So there is no advantage to going first or second and thus WTP = 0 for both.

3. $MR = \frac{d(PQ)}{dQ} = \frac{d(Q(48-Q))}{dQ} = 48 - 2Q$

a) Setting MC=MR, get $4 = 48 - 2Q \to 2Q = 44 \to Q = 22$, which yields $\Pi = (P - MC)Q - FC = (48 - 22 - 4)22 - FC = 22^2 - FC = 484 - FC$.

b) Pretty much zero if entry is free and FC=0. If FC $> 0$ things are more complicated. Entrants then would actually lose money in Bertrand competition. One can therefore argue that no firms would enter, and things would be same as a). Alternatively one can argue that a few firms might enter and tacitly collude to earn profits that wouldn't attract additional entrants.

c) Assuming FC = 0, he'd be willing to pay up to 484, as long as potential entrants realize they can't win a price war against an incumbent firm with lower marginal cost, and hence are deterred from entering.

Actually, the monopoly profit is a little higher with MC =2 than with MC = 4. Repeating the calculations in a) with 2 instead of 4, you get $Q = 23, p = 25$ and $\Pi = 529$. So, under current assumptions, he'd actually be be willing to pay up to 529.

4. a) E[loss] $= 1000(0.1) + 0(0.9) = 100$

$\mathrm{Var[loss]} = (1000-100)^2(0.1) + (0-100)^2(0.9) = 81000(0.1) + 10000(0.9) = 90,000.$

b) CE = -$E[L] - \frac{r}{2}Var[L] = -100 - \frac{0.002}{2}90,000 = -190.$

c) \$100 (+ small overhead+risk premium, perhaps \$5 or so)

d) If they charged \$190 they'd only get customers more risky than you, so losses could average much more than \$100, maybe over \$200 and in that case they'd lose money. This is an example of adverse selection. Also, insured customers may become more reckless, in which case the losses would also have a higher average; this is moral hazard.

5. a) Auction theory suggests that you'd be more likely to purchase and more likely to pay a lower price, at the site with fewest bidders. By revenue equivalence (assuming IPV) the format does not matter.

b) Other economics theories might note that there might be a reason why D has the fewest bidders. For example, experienced buyers might know that the seller at D sometimes sends damaged goods, or sends the goods late.

6. a) $P = MC_u = 8$

b) $R = PQ = (80-4Q)Q \implies MR = 80 - 8Q$
$NMR = MR - MC_d = 80 - 8Q - 4 = 76 - 8Q$

$\pi_{\max} : NMR = MC_u \implies 76 - 8Q = 8 \implies 8Q = 68 \implies Q = 8.5$ We will proceed under the assumption that half-rockets are not saleable, and use $Q = 8$.

Then $P = 80 - 4*8 = 48 \implies \Pi = R - C = 48*8 - (120 + 8*8) - (80 + 4*8) = 88.$

c) Rockets should sell engines separately if they can make enough profit on the engines to offset the lower profit on assembling and selling spaceships. Of course Rockets would increase the transfer price so it would equal the price they charge competitors for the engines.