

Economics 101
 Practice Questions #5
 Answer Key

1.
 - a. If the market were purely competitive, by equating $12 - 2Q = 2Q$ we can obtain the equilibrium price = \$6 and quantity = 3.
 - b. i). The equation for MR curve is $MR = 12 - 4Q$.
 ii). The single-price monopolist produces at the output where $MR = MC$, so the profit-maximizing output = 2; and by putting $Q = 2$ into demand function, we get price = \$8.
 - c. A monopoly has a higher price and a lower output than does a purely competitive market.
 - d. At output level = 2, $MC = MR = 4$. Hence, deadweight loss = $(8 - 4) \times 1 / 2 = \$2$.

2.
 - a.

P	Q	TR	MR	TC	ATC	MC
20	0	0	-	3	-	-
18	1	18	18	4	4	1
16	2	32	14	6	3	2
14	3	42	10	10	10/3	4
12	4	48	6	16	4	6
10	5	50	2	26	5.2	10

- b. The single-price monopolist produces 6 units, in which $MC = MR$ and it sets price at \$12. The economic profit = \$32.
- c. If the market were purely competitive, the equilibrium price = \$10 and output = 5, where $MC = P$.
- d. If the market were a monopoly and it practiced perfect price discrimination, the highest price it can charge = \$20 and the lowest price = \$10.
- e. Total profit = $(18 + 16 + 14 + 12 + 10) - 26 = 44$. The extra profit it can earn by perfect price discrimination than by a single price = $44 - 12 = 32$.

3.
 - a. The payoff matrix: (In any box, the number in the lower-left corner is the payoff for Toyota; and the number in the upper-right corner is the payoff for Ford)

		Ford	
		Introduce	Not Introduce
Toyota	Introduce	18	15
	Not Introduce	22	20
	Introduce	16	20

- b. Each has a dominant strategy to “Introduce the New Model.”
- c. The equilibrium outcome in this game is that both companies will introduce the new model.
- d. Since it is better off for both to choose “Not Introduce,” in the long run, we can predict that the equilibrium outcome in this game if it is played many times will be that they both won’t introduce the new model.

4.

Q	P	TR
4	24	96
5	21	105
6	18	108
7	15	105
8	12	96
9	9	81

- a. If the market were a single-price monopoly, the profit-maximizing price = \$18 and output = 6.
- b. When $q_1 = 3$ and $q_2 = 3$, the market price is 18. The economic profit for each firm = $3 \times 18 = 54$.
- c. When $q_1 = 3$ and $q_2 = 4$, the market price is 15. The economic profit for Firm 1 = $3 \times 15 = 45$, and the economic profit for Firm 2 = $4 \times 15 = 60$.
- d. When $q_1 = 4$ and $q_2 = 4$, the market price is 12. The economic profit for each firm = $4 \times 12 = 48$.
- e. If Firm 1 produces at $q_1 = 3$, it is better for Firm 2 to choose $q_2 = 4$ because $60 > 54$. If Firm 1 produces at $q_1 = 4$, it is still better for Firm 2 to choose $q_2 = 4$ because $48 > 45$. It is analogous for Firm 1. Hence the dominant strategy is to choose $q_1 = 4$ for Firm 1 and $q_2 = 4$ for Firm 2. The equilibrium outcome in this duopoly market is therefore $q_1 = 4$ and $q_2 = 4$ and market price = \$12.
- f. The total output is 8 in the duopoly market. We can see that the output is larger and the price is lower than those in the monopoly outcome.

5.

- a. MES for market A is larger than 10,000 units; 5,000 units for market B; and 500 units for market C.

- b. The maximum number of firms in market A is 1; it is 2 in market B; and 20 in market C.
- c. Market A is natural monopoly; Market B is natural oligopoly; Market C is competitive market. The number of firms in market identifies the type of market.
- d. In case of natural monopoly, since the LRATC is decreasing when output increases, the existing firm can earn positive profits by producing an extra unit as long as it is not at the minimum point of LRATC. Since new entrants have higher cost per unit, potential entrants are deterred from entering the market.

In case of natural oligopoly and the competitive market, each firm in the market will produce until it reaches the minimum point of LRATC, \$10, which is also the lowest possible cost per unit. If the existing firms want to produce more in an attempt to deter potential entrants from entering the market, they have to produce at the level where LRATC is increasing. Therefore the potential entrants will continue entering into the market until every firm in the market produces at the output level where it is at the minimum level of the LRATC.

- 6.
 - a. $P_M > P_{MC} > P_{PC}$. In the long run, the economic profits under (MC) and (PC) are zero. The economic profits under (M) are positive.
 - b. $P_M > P_{MC}$ because there are other suppliers who provide similar products under (MC) so that the price can not be as high as monopoly. That is, a monopolistic competitive firm faces a flatter demand curve. $P_{MC} > P_{PC}$ because firms face a downward sloping demand curve under (MC) so that firms produce up to the level where demand curve is tangent to the ATC curve. Under (PC) every firm produces at the minimum level of ATC.
 - c. Since the demand facing the firms is downward sloping under (MC), if firms produce at the minimum level of the ATC, there are positive profits and other firms have an incentive to enter into the market. Hence, there are too many firms producing too little; that is, there is excess capacity. In contrast, in (PC) firms in the long run produce at the minimum level of the ATC, make zero economic profits and there is no incentive for entry or exit by firms in the market. Under (M), there exist barriers of entry that persist into in the long run. Thus, under (M) the monopoly does not produce at the minimum point of the ATC. In the long run the (M) earns positive economic profits and there is no entry due to barriers to entry.