Homework 4 – KEY

Due on 6/2/2024, by 23:00

This assignment is optional but STRONGLY RECOMMENDED. If you do not submit the answers till the deadline, the score of your final exam will substitute for the score for this assignment. Submit only the correct letter for each task on eLearn under 'Quizzes' within 'COR2100-Economics and Society G7-8-9-10'. Note that the actual text of questions and answers is not supposed to appear on the eLearn quiz. You have unlimited attempts. The system is programmed to credit your last attempt. Be informed that if you submit an attempt and afterwards you re-open the quiz, you must submit your answers AGAIN. Otherwise, the system will grade the unfinished attempt with 0 (because it is the last one) and there is NOTHING I can do to fix this after the fact. Late homework or homework submitted outside eLearn cannot be accepted as this would violate SMU official policy for fairness and transparency in grading. This assignment is protected by Grade Insurance™: If the assignment's average turns out to be below 75, an equal amount of bonus points will be given to every work, for the average to become 75. Direct any homework questions to your TA.

Scenario 4.1*: The market demand for robot vacuums is $p = 1,200 - 10q$ and $MC = 20q$.*

1. According to scenario 4.1, how much is the AVC of the first 5 robot vacuums?

   14% A. Around $15.
   10% B. Around $30.
   C. Around $45.
   62% **D. Around $60.**
   E. Around $75.
   [The AVC of the first 5 robot vacuums is (20+40+60+80+100)/5=$60]

2. According to scenario 4.1, what is the PC profit maximizing quantity?

   A. Around 10 robot vacuums.
   B. Around 20 robot vacuums.
   C. Around 30 robot vacuums.
   98% **D. Around 40 robot vacuums.**
   E. Around 50 robot vacuums.
   [In PC, $p = MC$. So, $1,200 - 10q = 20q$ or $30q = 1,200$ or $q = 40$ robot vacuums]

3. According to scenario 4.1, what is the PC price?

   A. Around $600.
   B. Around $700.
   98% **C. Around $800.**
   D. Around $900.
   E. Around $1,000.
   [From the previous question, $p = 1,200 - 10 \cdot 40$ or $p = \$800$]

4. ✓ According to scenario 4.1, what is the monopolistic profit maximizing quantity?

    A. Around 10 robot vacuums.

    B. Around 20 robot vacuums.

91% C. **Around 30 robot vacuums.**

    D. Around 40 robot vacuums.

    E. Around 50 robot vacuums.

    [In monopoly, $MR = MC$. So, $1,200 - 20q = 20q$ or $40q = 1,200$ or $q = 30$ robot vacuums]

5. ✓ According to scenario 4.1, what is the monopolistic price?

    A. Around $600.

    B. Around $700.

    C. Around $800.

88% D. **Around $900.**

    E. Around $1,000.

    [From the previous question, $p = 1,200 - 10 \cdot 30$ or $p = \$900$]

6. ✓ According to scenario 4.1, how much the is the consumer surplus if the market is a monopoly?

    A. Zero.

    B. Around 1,500.

    C. Around 3,000.

78% D. **Around 4,500.**

    E. Around 6,000.

    F. Around 7,500.

    [It will be triangle ABC. The height of the triangle is 30 and base is 1,200-900=300. Thus, the area is 30·300·0.5=4,500]
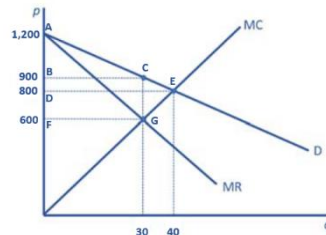
7. ✓ According to scenario 4.1, how much the is the DWL if the market is perfect competitive?

96% A. **Zero.**

    B. Around 500.

    C. Around 1,000.

    D. Around 1,500.

    E. Around 2.000.

    F. Around 2,500.

    [There is no DWL in PC markets]

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8. According to scenario 4.1, how much the is the DWL if the market is a monopoly?

    A. Zero.

18%B. Around 500.

11%C. Around 1,000.

60%D. **Around 1,500.**

    E. Around 2,000.

    F. Around 2,500.

[It will be triangle CEG. The height of the triangle is 40-30=10 and the base is 900-600=300. Thus, the area is 10·300·0.5=1,500]

9. According to scenario 4.1, how much will the monopolist's profit be, if FC = $8,000?

    A. Zero.

    B. Around $2,500.

    C. Around $5,000.

    D. Around $7,500.

56%E. **Around $10,000.**

17%F. Around $12,500.

[Revenue is $30 \cdot 900 = \$27,000$. Cost is $8,000 + [20 + 40 + 60 + \cdots + 600] = 8,000 + 15 \cdot 620 = \$17,300$. Thus, the profit is $27,000 - 17,300 = \$9,700$]

10. Which of the following is accurate?

18%A. **Monopolies have more market power than PC firms.** *[Monopoly can price above MC while the PC firm cannot]*

    B. Monopolies have more profits than PC firms. *[Not necessarily, depends on demand and cost]*

80%C. Both A and B.

    D. None of the above.

11. Suppose that the production of a new iPhone has AVC constant at $200. How much will the profit maximizing price be if the elasticity of demand for the iPhone is -1.2?

    A. Around $600.

    B. Around $800.

    C. Around $1,000.

66%D. **Around $1,200.**

    E. Around $1,400.

28%F. We have insufficient information to answer.

[If AVC is constant at $200, $MC = 200$. By using the markup rule $p = MC \cdot \left[1 + \frac{-1}{1+\varepsilon_d}\right]$ or $p = 200 \cdot \left[1 + \frac{-1}{1-1.2}\right]$ or $p = 200 \cdot [1 + 5]$ or $p = \$1,200$]

12. Which of the following is more likely to increase the market power of Coca-Cola?

    A. A peer-reviewed study linking soft drinks to cancer. *[Lower demand – less market power]*

94%B. **A new advertisement campaign featuring Billie Eilish.** *[Higher demand – more market power]*

    C. Elon Musk starts selling cola-X. *[More competitors – less market power]*

    D. All of the above.

Scenario 4.2: The table below shows the quantity, total revenue and total cost of a monopolist with zero fixed cost.

Quantity	1	2	3	4	5	6
Total Revenue	200	350	480	600	700	780
Total Cost	130	190	270	365	460	600

13. According to scenario 4.2, how many units will the monopolist produce?

  A. 1 unit.
  B. 2 units.
  C. 3 units.
  D. 4 units.
  93% E. 5 units.
  F. 6 units.

  [From the table below, we can see that the closest $MR = MC$, where $MR > MC$, is at $q = 5$:

q	1	2	3	4	**5**	6
R	200	350	480	600	700	780
MR	200	150	130	120	**100**	80
C	130	190	270	365	460	600
MC	130	60	80	95	**95**	140
Π	70	160	210	235	240	180

14. According to scenario 4.2, how much will the monopolist charge?

  A. Around $100.
  B. Around $120.
  80% C. Around $140.
  10% D. Around $160.
  E. Around $180.
  F. Around $200.

  [Since the quantity is 5 units and total revenue is $700, the price must be $140 per unit]

15. Which of the following is most likely to be the reason why governments avoid imposing sales-taxes on pharmaceutical products with inelastic demand?

  A. The tax would decrease the monopolist's profits.
  B. The tax would increase the monopolist's profits.
  81% C. The tax would increase the DWL.
  D. The tax would not yield revenue for the state.

  [Due to the inelasticity of demand, the tax will increase the price by a large amount (perhaps more than the value of the tax) and will decrease the quantity demanded, leading to an increase of the DWL]

q	0	1	2	3	4	5	6	7
p	150	135	118	100	83	69	58	49

Table 4.1: The demand schedule for a monopolist

16. According to table 4.1, what is the profit maximizing quantity for the monopolist if $AVC = \$30$ for every q?

  A. Zero.
  B. 1 unit.
  C. 2 units.
  14% D. 3 units.
  68% E. **4 units.**
  F. 5 units.
  G. 6 units.
  H. 7 units.

  [Since AVC is constant at \$30, marginal cost will also be $MC = \$30$. Thus, we should look for the closest $MR = MC$, which happens at the 4th unit as we can observe from the table below

q	0	1	2	3	**4**	5	6	7
p	150	135	118	100	83	69	58	49
R	0	135	236	300	332	345	348	343
MR	-	135	101	64	**32**	17	3	-5

17. According to table 4.1, how much will the monopolist's profit be if $AVC = \$30$ for every q and the fixed cost is equal to \$10?

  A. Around \$50.
  B. Around \$100.
  10% C. Around \$150.
  71% D. **Around \$200.**
  E. Around \$250.
  F. Around \$300.

  [For $q = 4$ units, the revenue will be $R = 4 \cdot 83$ or $R = \$332$ and total cost will be $C = \text{AVC} \cdot q + \text{FC}$ or $C = 30 \cdot 4 + 10$ or $C = \$130$. Thus, profit will be $\Pi = R - C$ or $\Pi = 332 - 130$ or $\Pi = \$202$]

18. In most countries, there is absence of a human's organs market. Which of the following problems would an organized organ market fail to meet?

  17% A. The huge DWL. *[An organized market could decrease the DWL]*
  B. The astronomical prices of human organs. *[An organized market could decrease prices]*
  14% C. The low supply of human organs. *[An organized market would incentivize more people to sell some of their organs, thus increasing the supply]*
  64% D. **Only people with the ability to pay the market price will benefit from the market.** *[Unfortunately, not all people would have the ability to take advantage of such a market]*
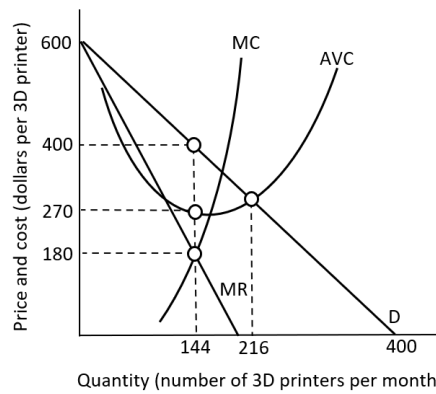
Figure 4.1: the demand and cost curves for a monopolist, who produces 3D printers

19. According to figure 4.1, how much is the price elasticity of demand for printers when the monopolist sells 216 printers?

A. $-\infty$.

41% B. Around -1.5.

23% C. -1.

28% D. Around -0.5.

E. 0.

> [At $q = 216$ the MR is negative. This means that decreasing the price to sell an extra unit will make revenue decrease. When price decreases and revenue decreases too, price elasticity is $-1 < \varepsilon_D < 0$. See PS2 task 3 for more]

20. According to figure 4.1, how much will the monopolist's monthly profit be if the fixed cost is $4,000?

A. Around $5,000.

B. Around $10,000.

78% C. Around $15,000.

10% D. Around $20,000.

E. Around $25,000.

F. Around $30,000.

> [The monopolist will sell 144 printers at 400 dollars each. Monthly revenue is $400 \cdot 144 = \$57{,}600$. From the AVC figure we can see that the monthly average cost per printer $270, so the total monthly cost will be is $4{,}000 + 270 \cdot 144 = \$42{,}880$. Thus, the profit per month for the monopolist will be $57{,}600 - 42{,}880 = \$14{,}720$]