

Econ 200B Final Key

Monday, December 9, 2019 10:42 AM

Do not open this booklet until you receive permission from the instructor!

**Econ 200B
Autumn 2019
Final Exam**

Name:

TA/Quiz Section/Time:

Key

125 points

You have 110 minutes to complete the exam.

Reminder: No graphing calculators or smart phones allowed! Please write legibly and show your work on every problem. Use two decimal places of precision when necessary.

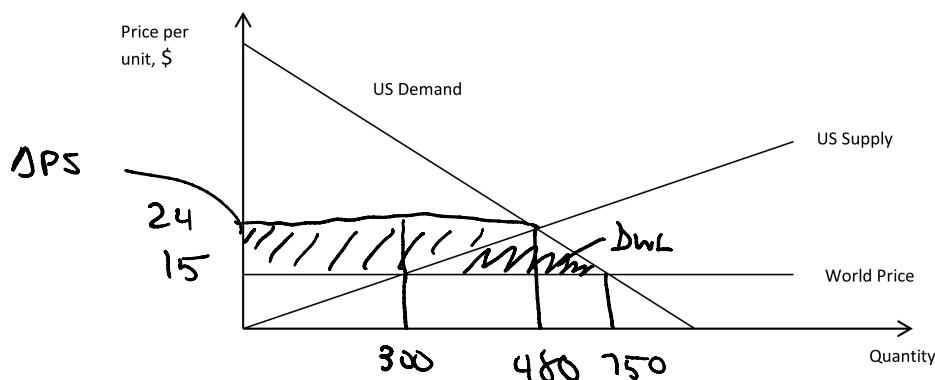
Academic integrity is the cornerstone of the Department's rules for student conduct and evaluation of student learning. Students accused of academic misconduct will be referred directly to the Office of Community Standards and Student Conduct for disciplinary action pursuant to the Student Conduct Code and, if found guilty, will be subject to sanctions. Sanctions range from a disciplinary warning, to academic probation, to immediate dismissal for the Department and the University, depending on the seriousness of the misconduct. Dismissal can be, and has been, applied even for first offenses. Moreover, a grade of zero can be assigned by the instructor for the course.

1. (25 points) The U.S. domestic market for digital watches is perfectly competitive and shown on the graph below. The domestic supply and demand are given by:

$$Q_d = 1200 - 30P$$

$$Q_s = 20P$$

The world price for digital watches is \$15. You may find it helpful, but it is not required, to draw the quantities you calculate for parts a-d on the graph below (not to scale).



- a. (7 points) Find the number of watches imported under free trade in this market. What is the consumer surplus from free trade?

3pts $\left\{ \begin{array}{l} Q_{dft} = 1200 - 30P = 1200 - 30 \cdot 15 = 750 \end{array} \right.$

2pts $\left\{ \begin{array}{l} Q_{sft} = 20P = 20 \cdot 15 = 300 \end{array} \right.$

1pt $\left\{ \begin{array}{l} \text{imports} = 750 - 300 = 450 \end{array} \right.$

- b. (7 points) If the US passes a law completely eliminating trade in digital watches (quota=0), find the gains in producer surplus from this policy.

2pts $\left\{ \begin{array}{l} Q_{d0} = Q_{s0} \quad (\text{trade}=0) \Rightarrow 1200 - 30P = 20P \end{array} \right.$

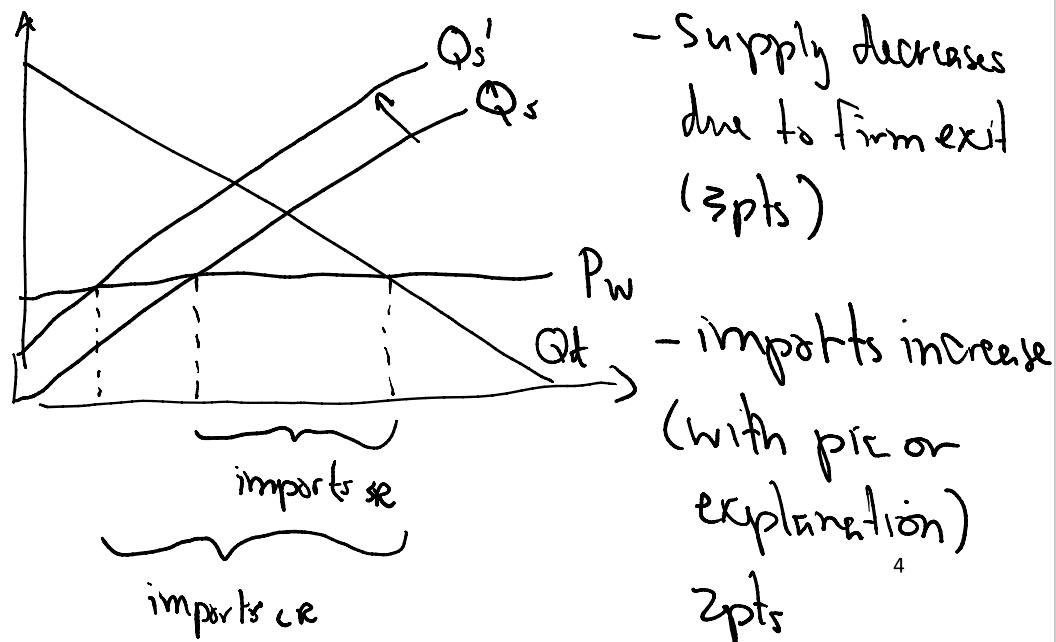
2pts $\left\{ \begin{array}{l} 1200 = 50P \\ P = \$24 \Rightarrow Q_s = 480 \end{array} \right.$

3pts $\left\{ \begin{array}{l} \Delta PS = (\$24 - \$15) \cdot 300 + \frac{1}{2} (\$24 - \$15) \cdot 160 \\ \$2700 + \$810 = \$3510 \end{array} \right.$

c. (6 points) What is the deadweight loss under b?

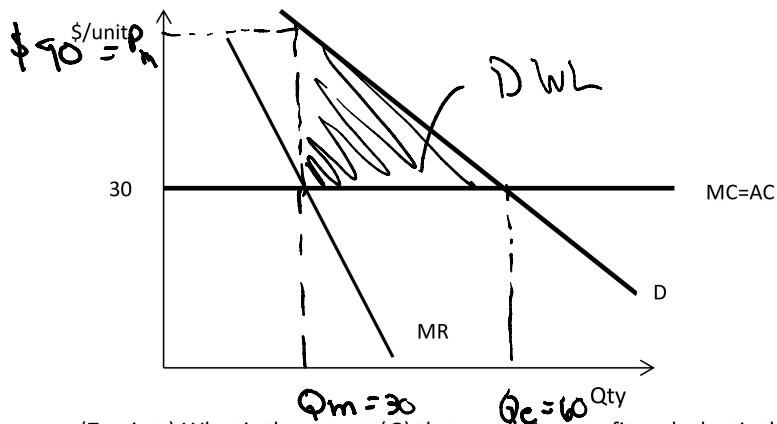
$$DWL = \frac{1}{2} (19)(150 - 300) = \$2025$$

d. (5 points) If, in general, domestic watch firms make negative profits in the short run due to the opening of the market to trade (because prices fall), would you expect US watch imports to increase or decrease as the US market settles into long run equilibrium? Why? Assume that the change in imports won't affect the world price and use a diagram or a clear economic explanation (or both).



2. (25 points) Seattle Eco Car holds a patent for a solar powered car, making it a monopoly producer of this product. Market demand is found from $P=150-2Q$, while marginal revenue is $MR=150-4Q$. Marginal cost =Average cost= 30 and total cost = $30Q$.

(Use of graph is optional.)



a. (7 points) What is the output (Q) that maximizes profit and what is the price (P) charged?

$$3 \text{ pts} \quad \left\{ \begin{array}{l} Q_m: \quad MR = MC \quad 150 - 4Q = 30 \Rightarrow Q = 30 \quad (1 \text{ pt}) \\ P_m: \quad P^m = 150 - 2 \cdot Q^m = 150 - 2 \cdot 30 = \$90 \end{array} \right.$$

$$3 \text{ pts} \quad \left\{ \begin{array}{l} P_m: \quad P^m = 150 - 2 \cdot Q^m = 150 - 2 \cdot 30 = \$90 \end{array} \right.$$

b. (7 points) What is Eco Car's profit at the output and price from a?

$$3 \text{ pts} \quad \left\{ \begin{array}{l} \Pi = (P^m - AC) \cdot Q^m \end{array} \right.$$

$$4 \text{ pts} \quad \left\{ \begin{array}{l} = (\$90 - \$30) \cdot 30 = \$1800 \end{array} \right.$$

- c. (6 points) What would the market price and quantity be if the market transformed into a perfectly competitive market in the long run? State the rule you used to find this answer.

$$3 \text{ pts} \left\{ P^e = MC \Rightarrow 150 - 2Q^e = 30 \right.$$

$\underbrace{\quad}_{1 \text{ pt}}$

$$(1 \text{ pt}) \quad Q^e = 60$$

$$1 \text{ pt} \quad P^e = \$30$$

- d. (5 points) Calculate the deadweight loss of the monopoly.

$$DWL = \frac{1}{2} (\$90 - \$30) \cdot (60 - 30) = \$900$$

3. (25 points) Answer the following questions about externalities.

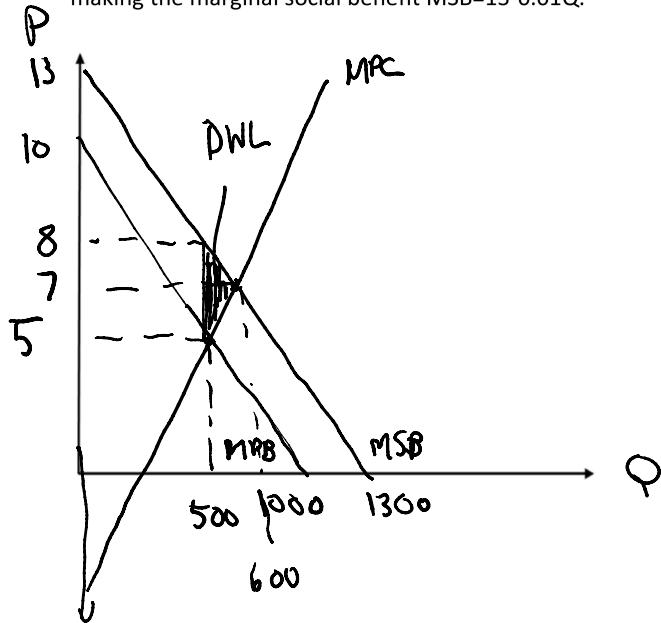
- a. (6 points) If people took external costs like pollution into consideration, would they consume more or less of the goods that carry external costs? Is there such a thing as an optimal amount of pollution? Explain.

(2 pts) - Less

- Yes, just like with any other production decision, we would be able to weigh the costs of pollution against the benefits (which would likely be due to the goods being produced), and produce up to the point where $MSC = MSB$. (3 pts)

→ As long as we get any benefit from pollution, the optimal amount is unlikely to be zero. ← (1 pt)

The demand for flu shots (marginal private benefit) is given by $P=10-0.01Q$. The supply (marginal private cost) is given by $P=0.02Q-5$. There is a \$3 positive externality on flu shots, making the marginal social benefit $MSB=13-0.01Q$.



- b. (7 points) Find the private equilibrium price and output in this market. Draw the MPC and MPB on the graph above, along with this equilibrium.

3 pts { $10 - 0.01Q = 0.02Q - 5$ } 1 pt

1 pt { $15 = 0.03Q$
 $Q = 500$ }

1 pt { $P = 10 - 0.01Q = 10 - 5 = \5 }

- c. (7 points) Find the socially efficient price and output in this market. Draw this outcome on the graph, along with the MSB. 1 pt

3 pts { $13 - 0.01Q = 0.02Q - 5$

$$18 = 0.03Q$$

1 pt { $Q = 600$

1 pt. { $P = 13 - 0.01 \cdot 600 = \7

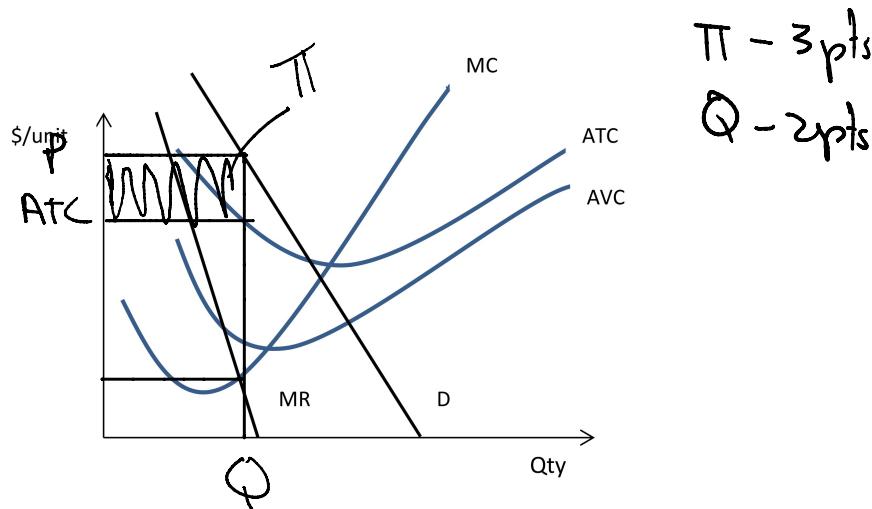
→ 1 pt

- d. (5 points) Find the deadweight loss in this market. Draw it on the graph and calculate it.

4 pts: $DWL = \frac{1}{2} (\$8 - \$5)(600 - 500) = \$1500$

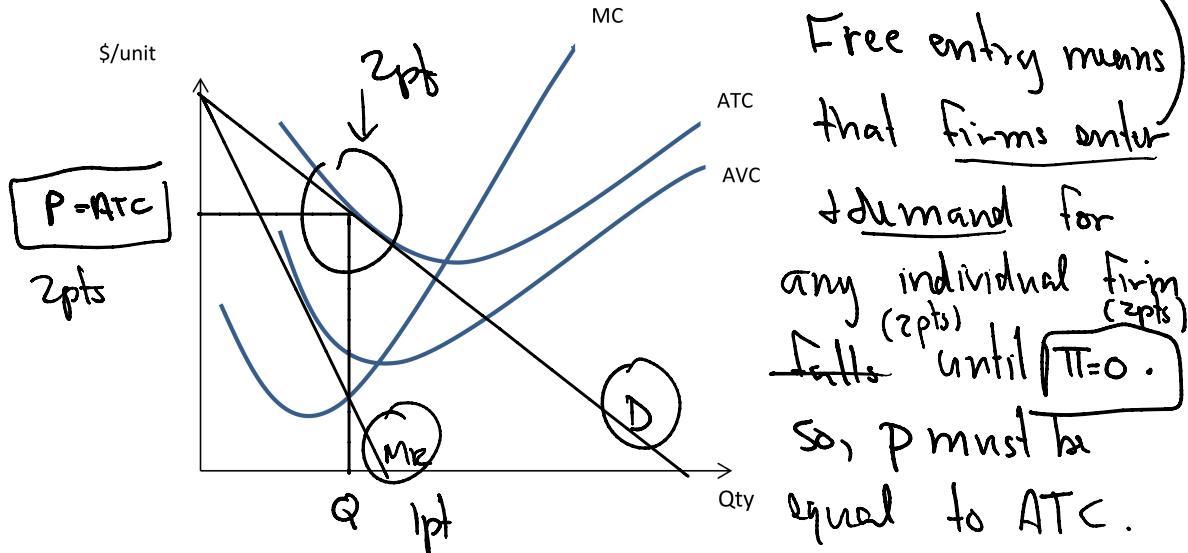
to get \$8: $13 - 0.01 \cdot 500 = \$8$ (if necessary)

4. (30 points) Answer the following questions about monopolistic competition and oligopolies.
 a. (5 points) The figure below shows short-run cost curves, demand, and marginal revenue for a firm in a monopolistically competitive market. Indicate the firm's profit maximizing output and identify the firm's profit by drawing it on the figure.



- b. (10 points) Draw what happens in the long run to the monopolistically competitive market from part b and explain why that is happening with words. (hint: Draw long run D, MR, Q and P and explain why you drew them that way.)

(1pt)



- c. (6 points) Why is the outcome in b not allocatively or productively efficient? Briefly define allocative and productive efficiency as part of your answer.

2pts definition } Allocative : Goods sold up to the point where $MC = MB$. Here, because $MR \neq MB$, we see under-consumption.
1pt answer }

2pts definition, } Productive: Goods produced at output where ATC is minimum. That can 1pt answer never happen here because P slopes down & can't ever be tangent⁹ to the ATC curve at its minimum.

- d. (4 points) What can the firm in part b do to increase their profits. Will that increase or decrease the deadweight loss in the market? Why?

1pt They can try to rebrand or refresh their brand in some way that increases their demand + makes it less elastic.

2pts 1pt It will probably increase DWL because the quantity sold will go down.

- e. (5 points) Now, think about oligopolies. Explain, in 2 or 3 sentences, why firms in an oligopoly market care about the output chosen by other firms. If it helps, you can explicitly consider the difference between oligopolies and perfectly competitive firms in this regard.

3pts { In an oligopoly market, the price at which the firm can sell their goods will depend on their own q as well as the other firms' q. This matters because it determines the first firm's profit.

2pts { In PC markets, on the other hand, ¹⁰ the firm's price (and profits) don't depend on choices by other firms.

5. (20 points) Answer the following questions about economic production and costs.
- a. (4 points) Mike wants to open his own repair shop, and is considering using his savings of \$30,000 to get it started. He is currently earning 3 percent interest on his savings. His friend Bob calls him and asks to borrow \$30,000 to start up a bagel shop; Bob offers to pay him 5 percent interest if he loans him the money. If Mike were to use the money to open his own repair shop instead, what is the cost of using his savings? Is this an implicit or explicit cost?

Best use of his \$:

1pt Loan to bob @ 5 percent

2pts { Cost = $\$30,000 \times 0.05\% / \text{year}$
 = \$1500

1pt this is an implicit cost

- b. (4 points) True or false, in constant returns to scale production, average total cost does not depend on the quantity of output. Explain.

1pt True.

3pts

{ Why? CRS means that scaling up all inputs (by some amount, say α) will lead to outputs increasing by same amount

$$\Rightarrow \boxed{ATC = \frac{TC}{Q} = \frac{\alpha + C}{\alpha Q}}$$

any explanation¹¹ that describes this is ok.

- c. (6 points) Explain what "diminishing marginal product" means and why the marginal product of labor diminishes in the short run. Why doesn't it (necessarily) diminish in the long run?

Diminishing marginal product =

- 2pts { MP = the additional output produced when one more unit of one of the inputs are added, holding all other inputs constant. It falls as you add more of one input because the other inputs get used beyond their capacity (or similar)
- 2pts { In the long run, all inputs are variable, so we don't see this.

- d. (6 points) Explain "minimum efficient scale" in terms of long run firm costs. Is a market productively efficient in the long run if all firms are operating at minimum efficient scale?

- 1pt — Minimum efficient scale is the
→ level of output where firms no
3pts → longer experience economies of scale. In other words, before this point, ATC is falling. After, it is constant (or rising).

- 2pts. — Yes

SCRATCH PAPER

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