

Answers to Practice Problems from Chapter 8 and Chapter 9 also homework 3 and 4 and inclass problems from Chapter 6, 7, and 8

1. Questions for Review page 295 number 4

Economic profits are the difference between total revenues and total costs, producer surplus is the difference between total revenue and variable costs. Therefore, the difference between economic profit and producer surplus is the fixed cost.

2. Questions for Review page 295 number 5

Firms enter an industry when they expect to earn an economic profit. These short-run profits are enough to encourage entry. Zero economic profits in the long-run imply normal returns to the factors of production, including the labor and capital of the owners of the firms (foregone wages/interest/rent). If the revenue minus other costs is just equal to what could be earned elsewhere, then the owner is indifferent to staying in business or exiting.

3. Questions for Review page 295 number 8

The long-run supply curve depends on the cost structure of the industry. If there is a fixed supply of actors and actresses, as more films are produced, higher salaries must be offered. Therefore, the industry experiences increasing costs. In an increasing cost industry, the long-run supply curve is upward sloping. Thus, the supply curve for videos would be upward sloping.

4. Exercises page 296 number 4

- profits are maximized where $MC = MR$. Here, $MR = P = \$100$ (because it is a perfectly competitive market). So $P = MC \Rightarrow 100 = 4q$, therefore $q = 25$
- Profits are given by: $TR - TC = P \cdot q - (200 + 2 \cdot 25^2) = \1050
- A firm will shut down if $P < AVC$. So $AVC = VC/q = 2q$. $MC = 4q$ so MC is greater than AVC for any quantity greater than 0. Therefore, the firm will always operate if price is positive.

5. Exercises page 296 number 5

- to maximize profits, the firm should set $MR = MC$, again this is perfect competition, so $MR = P = 9$. Therefore, $P = MC \Rightarrow 9 = 3 + 2q$ and $q = 3$
- Producer surplus is the area below the market price (\$9) and above the MC curve ($3 + 2q$). Because MC is linear, you can use the triangle formula (of $\frac{1}{2} b \cdot h$) to find the PS. $PS = \frac{1}{2} (6) \cdot (3) = 9$
- Profits are equal to $TR - TC$. TC is $VC + FC$ and $VC = AVC \cdot q$, so at a quantity of 3 $\Rightarrow VC = 6 \cdot 3 = 18$; $FC = 3$ so $TC = 21$. TR is $P \cdot q = 9 \cdot 3 = 27$, so profits are $TR - TC = 6$. Therefore, the firm is earning economic profits. Another way of solving this is to recall that Profits are $PS - FC = 9$ (from part b) $3 = 6$.

6. Exercises page 296 number 10

- Equilibrium P and Q are found by setting $S = D \Rightarrow 6500 - 400P = 1200P$. From this we know $P = \$5$, substituting into either Q^S or Q^D we find that $Q = 6000$. The output for a specific firm is where $MR = MC$ (again this is perfect competition, so $MR = P$) $\Rightarrow 5 = 2q/200$ or $q = 500$. Profit for the firm is $TR - TC = 528$. There are 12 firms in the industry (each firm producing 500 units with a total of 6000 units being produced).
- There are positive economic profits so firms would enter. As firms enter, the supply curve increases, driving prices down. This reduces profits as entry occurs until the normal profit is made (zero economic profits).
- In the long-run, the firm will not sell for a price below the minimum AC. To find the minimum AC you just minimize AC $\Rightarrow AC = 722/q + q/200 \Rightarrow$

$dAC/dQ = -722/q^2 + 1/200 = 0$; solving for q , $q = 380$. Plugging this into AC $722/380 + 380/200 = 1.9 + 1.9 = 3.8$. The firm will not sell for a price less than \$3.8

- d) The firm will sell for any positive price, because at any positive price $MC > AVC$ ($AVC = q/2000$). Profit is negative as long as price is below minimum AC (or if price is below \$3.8).

7. Exercises page 297 number 11

The firm should produce where $P = MC$ so $P = 115 = 14 + 4q = MC \Rightarrow q = 25$. Profit is $TR - TC = 800$. Producer surplus is profit plus $FC = 1250$.

8. Questions for Review page 333 number 2

When the supply curve is completely inelastic, the imposition of an effective price ceiling transfers all loss in producer surplus to consumers. Consumer surplus increases by the difference between the market-clearing price and the price ceiling times the market-clearing quantity. Consumers capture all decreases in total revenue. Therefore, no deadweight loss occurs.

9. Questions for Review page 333 number 9

A tax creates deadweight loss by artificially increasing the price above the free market level, thus reducing the equilibrium quantity. The reduction in demand reduces consumer as well as producer surplus. The size of the deadweight loss depends on the elasticities of supply and demand. As the elasticity of demand increases (becomes more elastic) and the elasticity of supply decreases (becomes more inelastic) the deadweight loss becomes larger.

10. Exercises page 333 number 2

- a) To find the equilibrium price and quantity, equate supply and demand and solve for Q : $10 - Q = Q - 4 \Rightarrow Q = 7$; substituting into either supply or demand to find price; $P = 3$
- b) With the imposition of a \$1 tax per unit, the demand curve for widgets shifts left. At each price, the consumer wishes to buy less. The new demand is $P = 9 - Q$. Therefore, the new equilibrium quantity is $9 - Q = Q - 4 \Rightarrow Q = 6.5$; substituting into demand to find the price consumers pay; $P = 9 - 6.5 = \$3.50$ (not the tax is \$1 but price only increases by \$0.50; the consumers and the producers share the burden of this tax). Substituting Q into supply to find the price producers receive; $P = 6.5 - 4 = \$2.50$.
- c) The original supply curve for widgets was $P = Q - 4$. With a subsidy to producers, the supply curve increases, and is now $P = Q - 5$. Setting this equal to demand the quantity with the subsidy is $10 - Q = Q - 5 = 7.5$. The buyer pays $(10 - 7.5) = \$2.50$ and the seller receives the price consumer pays plus the subsidy, $\$3.50$. The total cost of the subsidy is $\text{subsidy} \times q = 7,500 \times 1 = \$7,500$.