Chapter 14

2. Since a new customer is offering to pay $300 for one dose, marginal revenue between 200 and 201 doses is $300. So we must find out if marginal cost is greater than or less than $300. To do this, calculate total cost for 200 doses and 201 doses, and calculate the increase in total cost. Multiplying quantity by average total cost, we find that total cost rises from $40,000 to $40,401, so marginal cost is $401. So your roommate should not make the additional dose.

3. a. Remembering that price equals marginal cost when firms are maximizing profit, we know the marginal cost must be 30 cents, since that is the price.

b. The industry is not in long-run equilibrium since price exceeds average total cost.

4. Once you have ordered the dinner, its cost is sunk, so it does not represent an opportunity cost. As a result, the cost of the dinner should not influence your decision about stuffing yourself.

5. Since Bob’s average total cost is $280/10 = $28, which is greater than the price, he will exit the industry in the long run. Since fixed cost is $30, average variable cost is ($280 - $30)/10 = $25, which is less than price, so Bob won’t shut down in the short run.

10. The rise in the price of petroleum increases production costs for individual firms and thus shifts the industry supply curve up, as shown in Figure 8. The typical firm's initial marginal-cost curve is $MC_1$ and its average-total-cost curve is $ATC_1$. In the initial equilibrium, the industry supply curve, $S_1$, intersects the demand curve at price $P_1$, which is equal to the minimum average total cost of the typical firm. Thus the typical firm earns no economic profit.

The increase in the price of oil shifts the typical firm's cost curves up to $MC_2$ and $ATC_2$, and shifts the industry supply curve up to $S_2$. The equilibrium price rises from $P_1$ to $P_2$, but the price does not increase by as much as the increase in marginal cost for the firm. As a result, price is less than average total cost for the firm, so profits are negative.

In the long run, the negative profits lead some firms to exit the industry. As they do so, the industry-supply curve shifts to the left. This continues until the price rises to equal the minimum point on the firm's average-total-cost curve. The long-run equilibrium occurs with supply curve $S_3$, equilibrium price $P_3$, industry output $Q_3$, and firm's output $q_3$. Thus, in the long run, profits are zero again and there are fewer firms in the industry.
11. a. Figure 9 illustrates the situation in the U.S. textile industry. With no international trade, the market is in long-run equilibrium. Supply intersects demand at quantity $Q_1$ and price $\$30$, with a typical firm producing output $q_1$.

b. The effect of imports at $\$25$ is that the market supply curve follows the old supply curve up to a price of $\$25$, then becomes horizontal at that price. As a result, demand exceeds domestic supply, so the country imports textiles from other countries. The typical domestic firm now reduces its output from $q_1$ to $q_2$, incurring losses, since the large fixed costs imply that average total cost will be much higher than the price.

c. In the long run, domestic firms will be unable to compete with foreign firms because their costs are too high. All the domestic firms will exit the industry and other countries will supply enough to satisfy the entire domestic demand.
12. a. Figure 10 shows the current equilibrium in the market for pretzels. The supply curve, $S_1$, intersects the demand curve at price $P_1$. Each stand produces quantity $q_1$ of pretzels, so the total number of pretzels produced is $1,000 \times q_1$. Stands earn zero profit, since price equals average total cost.

b. If the city government restricts the number of pretzel stands to 800, the industry-supply curve shifts to $S_2$. The market price rises to $P_2$, and individual firms produce output $q_2$. Industry output is now $800 \times q_2$. Now the price exceeds average total cost, so each firm is making a positive profit. Without restrictions on the market, this would induce other firms to enter the market, but they cannot, since the government has limited the number of licenses.

c. The city could charge a license fee for the licenses. Since it is a lump-sum fee for the license, not based on the quantity of sales, such a tax has no effect on marginal cost, so won't affect the firm's output. It will, however, reduce the firm's profits. As long as the firm is left with a zero or positive profit, it will continue to operate. So the license fee that brings the most money to the city is to charge each firm the amount $(P_2 - ATC_2)q_2$, the amount of the firm's profit.

![Figure 10](image)

13. a. Figure 11 illustrates the gold market (industry) and a representative gold mine (firm). The demand curve, $D_1$, intersects the supply curve at industry quantity $Q_1$ and price $P_1$. Since the industry is in long-run equilibrium, the price equals the minimum point on the representative firm's average total cost curve, so the firm produces output $q_1$ and makes zero profit.

b. The increase in jewelry demand leads to an increase in the demand for gold, shifting the demand curve to $D_2$. In the short run, the price rises to $P_2$, industry output rises to $Q_2$, and the representative firm's output rises to $q_2$. Since price now exceeds average total cost, the representative firm now earns positive profits.

c. Since gold mines are earning positive economic profits, over time other firms will enter the industry. This will shift the supply curve to the right, reducing the price below $P_2$. But it's unlikely that the price will fall all the way back to $P_1$, since gold...
is in short supply. Costs for new firms are likely to be higher than for older firms, since they’ll have to discover new gold sources. So it's likely that the long-run supply curve in the gold industry is upward sloping. That means the long-run equilibrium price will be higher than it was initially.