Section 6.1 and 6.2

Average Value and Consumer and Producer Surplus

- 1. A service station orders 100 cases of motor oil every 6 months. The number of cases of oil remaining t months after the order arrives is modeled by $f(t) = 100e^{-0.5t}$.
 - (a) How many cases are there at the start of the six-month period? How many cases are left at the end of the six-month period?

(b) Find the average number of cases in inventory over the six-month period.

2. In May 1991, Car and Driver described a Jaguar that sold for \$980,000. At that price only 50 have been sold. It is estimated that 350 could have been sold if the price had been \$560,000. Assuming that the demand curve is a straight line, and that \$560,000 and 350 are equilibrium price and quantity, find the consumer surplus at the equilibrium price.

| 3. | The demand | curve f | or a | product | has | equation | p = | $100e^{-0.008q}$ | and | the | supply | curve | has |
|----|----------------|---------------|-------|-----------------|------|-------------|--------|------------------|-------|--------|----------|---------|-------|
| | equation $p =$ | $4\sqrt{q}+1$ | 0 for | $0 \leq q \leq$ | 500, | where q i | is qua | intity and p | is pr | ice ii | n dollar | s per ı | ınit. |

(a) At a price of \$50 per unit, what quantity are consumers willing to buy and what quantity are producers willing to supply? Will the market push prices up or down?

(b) Find the equilibrium price and quantity. Does you answer to part (a) support the observation that market forces tend to push prices closer to the equilibrium price?

(c) Calculate and interpret the consumer and producer surplus at equilibrium.