Quiz 3: Section 1.4-1.5

1. A car wash operator pays \$35,000 for a franchise, then spends \$10 per car wash, which costs the consumer \$15. Find the profit function for the car wash operator.

2. The *equilibrium price and quantity* is similar to the break-even point for profit. Given a supply curve and a demand curve, the *equilibrium point* is where the two curves intersect; that is, where the two quantities are equal to each other.
   For a certain good, the supply curve is given by $q = 100 - 2p$ and the demand curve is given by $q = 3p - 50$. Find the equilibrium price, p, and quantity, q.

3. Assume that the number of zebra mussels in a bay is growing exponentially. Let $P(t)$ represent the number of zebra mussels as a function of the number of years since 2010. So a function modeling the population is of the form $P(t) = P_0 a^t$. Given that there were 2700 mussels at the start of 2010 and 3186 at the start of 2011,
   (a) Find the base, a. You may round your answer to two decimal places.
   (b) Find the relative growth rate, r.