Assignment #11

HW # 11 1.6 p 132 # 2, 12, 16, 18, 27, 28, 42, 43

2. a. \[ P(x) = R(x) - C(x) \]
    \[ = 215x - (105x + 1650) \]
    \[ = 110x - 1650 \]
    b. \[ P(50) = 110(50) - 1650 = 3850 \]

12. \[ C = 27x + b \]
    Use the fact that (50, 4350) is on line to solve for \( b \), the fixed costs.
    \[ 4350 = 27(50) + b \]
    \[ b = 3000 \]
    The cost function is \( C(x) = 27x + 3000 \).

16. \( R(x) = 81.50x \), \( C(x) = 63x + 1850 \)
    At the break-even point, \( R(x) = C(x) \), so
    \[ 81.50x = 63x + 1850 \]
    \[ 18.50x = 1850 \]
    \[ x = 100 \text{ units} \]

18. \( R(x) = 89x \), \( C(x) = 1400 + 75x \)
    At the break-even point, \( R(x) = C(x) \), so
    \[ 89x = 1400 + 75x \]
    \[ 14x = 1400 \]
    \[ x = 100 \text{ sets of recaps} \]

27. If price increases, then the demand for the product decreases.

28. If the price increases, then the supply will increase.

42. At the market equilibrium point,
    Demand = Supply, so
    \[ -2q + 320 = 8q + 2 \]
    \[ 318 = 10q \]
    \[ 31.8 = q \]
    \[ p = -2q + 320 \]
    \[ p = -2(31.8) + 320 = 256.40 \]

43. \( -\frac{1}{2}q + 28 = \frac{1}{2}q + \frac{4}{3} \)
    Required condition.
    \[ -5q + 168 = 2q + 68 \]
    Multiply both sides by 6 to simplify.
    \[ -5q = -100 \]
    \[ q = 20 \]
    Substituting into one of the original equations gives \( p = -\frac{1}{2}(20) + 28 = 18 \).
    Thus, the equilibrium point is \( (q, p) = (20, 18) \).