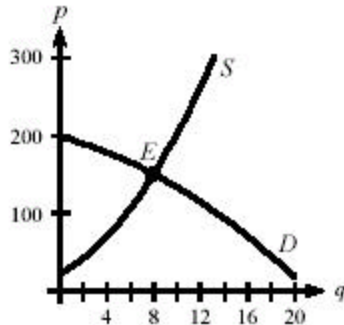


Assignment #12

HW # 12 2.3 p 174 # 4, 6, 18
 2.4 p 185 # 48, 50

4. a. Supply: $p = q^2 + 8q + 22$ (see below)
 b. Demand: $p = 198 - 4q - \frac{1}{4}q^2$ (see below)



- c. See E on the graph.
 d. Supply = Demand

$$q^2 + 8q + 22 = 198 - 4q - \frac{1}{4}q^2$$

$$5q^2 + 48q - 704 = 0$$

$$(5q + 88)(q - 8) = 0$$

$$q = 8 \text{ (only positive value)}$$

$$\text{When } q = 8, p = (8)^2 + 8(8) + 22$$

$$p = 150$$

$$\text{So, } E = (8, 150).$$

6. S: $p = q^2 + 8q + 20$
 D: $100 - 4q - q^2 = p$
 $q^2 + 8q + 20 = 100 - 4q - q^2$
 $2q^2 + 12q - 80 = 0$
 $2(q + 10)(q - 4) = 0$
 $q = 4$ (only positive value)
 When $q = 4$, $p = 4^2 + 8(4) + 20 = \$68$
 Equilibrium point: (4, 68)

18. At the break-even points, $R(x) = C(x)$.

$$1600x - x^2 = 1600 + 1500x$$

$$0 = x^2 - 100x + 1600$$

$$0 = (x - 20)(x - 80)$$

$$x = 20 \text{ or } x = 80 \text{ units}$$

Ch. 2.4 P. 185

48 is tricky, because x is in *hundreds* of gallons, so if you have 3000 gallons, (as in part b) then $x = 30$

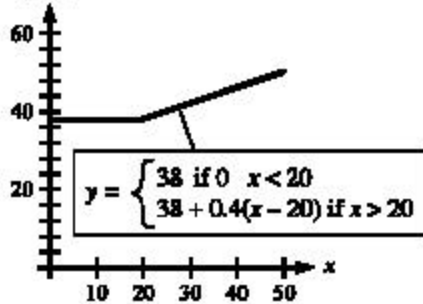
$$48. f(x) = \begin{cases} 38 & \text{if } 0 \leq x \leq 20 \\ 38 + 0.4(x - 20) & \text{if } x > 20 \end{cases}$$

a. $f(0.3) = \$38$

b. $f(30) = 38 + 0.4(30 - 20) = \42

c. $f(40) = 38 + 0.4(40 - 20) = \46

d. $f(x)$



50. a. $C(5) = 7.52 + 0.1079(5) = \8.06

b. $C(6) = 19.22 + 0.1079(6) = \19.87

c. $C(3000) = 131.345 + 0.0321(3000) = \227.65