8. a.) $P = 300 - 3Q_1 - 3Q_2$. if $Q_2 = 50$, then

$P = 300 - 3Q_1 - 150$ or $P = 150 - 3Q$

set $MC = MR \rightarrow 150 - 6Q_1 = 100$

$Q_1 = 8.33$

if $Q_2 = 20$ then $P = 240 - 3Q_1$, $MR = MC$

$240 - 6Q_1 = 100$

$Q_1 = 23.33$

b.) For Firm 1, $P = (300 - 3Q_2) - 3Q_1$

$(300 - 3Q_2) - 6Q_1 = 100$

$Q_1 = 33.33 - 0.5Q_2$

c.) set $Q_1 = Q_2$

$Q_2 = 33.33 - 0.5Q_2$

$Q_2 = 22.22$

d.) if this market were perfectly competitive

then equilibrium → $P = MC = 100$

e.) if the firms colluded monopoly price

then $300 - 6Q = 100$, $Q = 33.33$

$\therefore P = 300 - 3\left(\frac{200}{6}\right) = 200$

f.) $P = 100$

g.) firm 1 has $MC = 100$, firm 2 has $MC = 90$

for firm 1 → $P = (300 - 3Q_2) - 3Q_1$. setting $MR = MC$

$(300 - 3Q_2) - 6Q_1 = 100$

$Q_1 = 33.33 - 0.5Q_2$

for Firm 2 $P = (300 - 3Q_1) - 3Q_2$ $MR = MC$

$(300 - 3Q_1) - 6Q_2 = 90$

$Q_2 = 35 - 0.5Q_1$

So, market price → $P = 163.36$

h.) Firm 1 as leader, firm 2 will maximize profit by $Q_2 = 33.33 - 0.5Q_1$

$MC = MR : \quad Q_2 = 33.33 - 0.5Q_1$

$TR_1 = PQ_1 = (300 - 3Q_1 - 100 + 1.5Q_1)Q_1 =$

$(200 - 1.5Q_1)Q_1$

$MR_1 = 200 - 3Q_1$

$MR_1 = MC : 200 - 3Q_1 = 100$

$Q_1 = 33.33$

$Q_2 = 33.33 - 0.5(33.33) = 0.5(33.33)$

18 a.) $S_F = \begin{cases} 0 & P \leq 40 \\ 0.9P - 36 & P > 40 \end{cases}$

b.) $Q_R = \begin{cases} 200 - P & P \leq 40 \\ 236 - 1.9P & P > 40 \end{cases}$

c. Maximize Profit → $MR = MC = 40$

$$\left(\frac{10}{19}\right)(236 - 2Q_R) = 40$$

$$Q_R = 80$$

So, $P = 82.11$, $Q = 117.89$, Market

Share $= 0.68$ / 68%.

24.) a.) $Q_R = 500 - 2P_R + 100$

$$P_R = 300 - 0.5Q_R$$

Set $MC = MR \rightarrow MR = 300 - Q_R$

$$300 - Q_R = 70$$

$$Q_R = 290, \; P_R = 155$$

b.) $MC = MR = 10$

$Q_E = 500 - 2P_E + P_R$

$P_E = 250 - 0.5Q_E + 0.5P_R$

$TR_E = P_E Q_E = (250 - 0.5Q_E + 0.5P_R)Q_E$

$MR_E = 250 - Q_E + 0.5P_R$

$MR_E = MC_E = 10$

$250 - Q_E + 0.5P_R = 10$

$Q_E = 240 + 0.5P_R$

$Q_E = 500 - 2P_E + P_R$

$500 - 2P_E + P_R = 240 + 0.5P_R$

$260 + 0.5P_R = P_E$

$BR_E : P_E = 130 + 0.25P_R$

C.) $P_E = 130 + 0.25(130 + 0.25P_E)$

$P_E = P_R = 185.71$

26.) a.) for monopsonist

$$ME_L = W + L\frac{\Delta W}{\Delta L}$$

$$ME_L = 4L + L(4)$$

$$ME_L = 8L$$

b.) $MRP_L = ME_L$ where

$$MRP_L = P\frac{\Delta Q}{\Delta L}$$

in the example $\frac{\Delta Q}{\Delta L} = 0.5$, $MRP_L = 0.5P$

since $P = 32$, $MRP_L = 16$, $L = 2$, $W = 8$

c.) $W = MRP_L$, $L = 4$, $W = 16$