

1.

A.  $pq - q^2$

B.  $q = \frac{p}{2}$

C.  $Q_s = 5p$

D. Since there are 10 firms, the market supply is  $(5p)$ . Setting this equal to market demand of  $\frac{500}{10-p}$  and solving for  $p$  gives us:  $p \approx 16.1803$ .

E. Plug the equilibrium price into the firm supply:  $\approx 5 * 16.1803 = 80.9015$

F. Plug in the equilibrium price and firm supply into the profit function from part A:  $\approx -5236.04$

2.

A.  $p = 10 + \frac{500}{q}$

B.  $\left(10 + \frac{500}{q}\right)q - q^2$

C. 5

D. 110

E. 525

3.

A.  $(110 - q_i - Q_{-i}) - 10q_i$

B.  $q_i = \frac{1}{2}(100 - Q_{-i})$

C.  $q = \frac{100}{n+1}$

D.  $Q = \frac{n}{n+1}100, p = 110 - \frac{n}{n+1}100$

E.  $\begin{pmatrix} 66.6667 & 43.3333 \\ 90.9091 & 19.0909 \\ 99.0099 & 10.9901 \\ 99.9001 & 10.0999 \end{pmatrix}$

F.  $110 - \frac{n}{n+1}100$ . As  $n \rightarrow \infty, \frac{n}{n+1} \rightarrow 1$ . Thus,  $p \rightarrow 110 - 100 = 10$ .