

Q6

$$(a) \max_q [10 - q - (J-1)\bar{q}]q - q^2 - 1$$

Foc

$$[10 - (J-1)\bar{q}] - 4q = 0$$

in symmetric equil $\bar{q} = q = q^*$

$$\sum q^* = \frac{10}{J+3}$$

$$\sum \pi(q^*; \bar{q} = q^*)$$

$$= (10 - Jq^*)q^* - (q^*)^2 - 1$$

$$= \frac{[10(J+3) - J10]}{(J+3)} \frac{10}{J+3} - \frac{100}{(J+3)^2} - 1$$

$$= \frac{300 - 100}{(J+3)^2} - 1 > 0$$

$$\sum (J+3)^2 < 200$$

$$J < 10\sqrt{2} - 3$$

i.e. $J = 11$