

Day 8 problems

1. $\max_{x,y} f(x,y) = -x^2 - y^2 - 4x - 6y + 10$

$$\min_{x,y} f(x,y) = -4x^2 - y - 4x$$

2. $\min_{x,y} f(x,y) = \frac{-3y}{x^2 + y^2 + 1}$

3. $\max_{q_1, q_2} \pi(q_1, q_2) = (80 - q_1) q_1 - (80 - q_2) q_2 - c q_1 - c q_2 - \gamma q_1 q_2$.

What is the comparative static effect on q_1 and q_2 for a change in γ ?

4. Albert only cares about two goods and his utility is given by $x^{1/2}y^{1/3}$. Albert has \$50 to spend (he must spend it all) and he faces the prices $P_x=4$ and $P_y=5$. Find Albert's optimal bundle.

5. Alan has the same income and faces the same prices as Albert, but Alan's preferences are x^3y^2 . (that is Alan's utility function is Albert's raised to the 6th power). What should Alan purchase?

6. Minimize $x^2 + y^2 + z^3 - yz$ subject to $yz=4$ and $x+y=0$.

7. Maximize $f(x,y,z) = xz + yz$ subject to $y^2 + z^2 = 1$ and $xz = 3$.

8. Betty has \$M and has to decide how much money to invest in a risk asset. Cash not invested (C_1) can be consumed now. Cash invested will double with probability 0.5 and will be worth half as much with probability 0.5. Since future consumption is not as valuable as consumption today Betty's utility function is given by $\ln(C_1) + \beta \ln(C_2)$, where C_2 is the amount consumed in the future and $0 < \beta < 1$. How much should Betty invest?