Homework Set 8

1. Find the tangent cone to the set $\{(x,y) \mid x^2 - y \leq 0, \quad x + y \leq 2\}$ at any of its points (you will have to do cases).

2. Find a set of generators for the dual cone to the finite cone in R^2 generated by $(1,1)$ and $(2,3)$.

3. Find a set of generators of the cone $\{(x,y) \mid x - y \leq 0, \quad x + 2y \leq 0\}$

4. Let C be the finite cone in R^3 generated by $A=\{(1,1,1), (-1,1,1), (1,-1,1)\}$. Find C^+.

5. Write the Kuhn-Tucker conditions for the following problems and solve by any method.

a.   Minimize $f(x,y) = x^2 + y^2 - 4x - 4y$

        Subject to $\begin{array}{l} x^2 - y \leq 0 \\ x + y \leq 2 \end{array}$

b.   Minimize $f(x,y) = e^{-(x+y)}$

        Subject to $\begin{array}{l} e^x + e^y \leq 20 \\ x \geq 0 \end{array}$