1. Find the tangent cone to the set \( \{(x,y) | \, x^2 - y \leq 0, \, x + y \leq 2 \} \) 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 \( \mathbb{R}^2 \) generated by (1,1) and (2,3).

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

4. Let \( C \) be the finite cone in \( \mathbb{R}^3 \) 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 \( x^2 - y \leq 0 \)
      \( x + y \leq 2 \)

   b. Minimize \( f(x,y) = e^{-(x+y)} \)
      
      Subject to \( e^x + e^y \leq 20 \)
      \( x \geq 0 \)