

Consider the linear programming problem: Maximize $z = 2x + 3y$ subject to the constraints

$$x + 3y \leq 9$$

$$2x + 3y \leq 12$$

$$x \geq 0, y \geq 0.$$

1. Draw a sketch of the set of all feasible solutions $\begin{bmatrix} x \\ y \end{bmatrix}$ in the plane. This should be a polygon. Find and label all of the vertices. Add to your sketch level curves $z = k$ for several values of k .

2. Based on your sketch, explain how the level curves can be used to make a guess of the optimal solution $\mathbf{x}_{\text{opt}}$ to the LPP.

- Page 2