



**Problem 1** Minimize the following

$$\begin{cases} \min x^2 + y^2 + z^2 \\ \text{subject to} \\ 2y - 2z - 1 = 0 \\ 1 - x \leq 0 \end{cases}$$

**Problem 2** Minimize the following

$$\begin{cases} \min 2x_1^2 + 2x_1x_2 + x_2^2 - 10x_1 - 10x_2 \\ \text{subject to} \\ x_1^2 + x_2^2 \leq 5 \\ 3x_1 + x_2 \leq 6 \end{cases}$$

**Problem 3** Minimize the following

$$\begin{cases} \min \exp(x - y) \\ \text{subject to} \\ \exp(x) - \exp(y) \leq 20 \\ x \geq 0 \end{cases}$$