Exercise 1 Solve the following problem by using the active set method and taking $x^{(0)} = (x_1^{(0)}, x_2^{(0)}, x_3^{(0)}) = (0, 0, 1)$ as a starting point

$$\min_x f(x) = x_1^2 + 2x_2^2 + 3x_3^2$$
$$\text{s.t. } x_1 + x_2 + x_3 - 1 \geq 0$$
$$x_1, x_2, x_3 \geq 0.$$

Exercise 2 Solve the following problem using the interior point method:

$$\min_x f(x) = x_1 + x_2$$
$$\text{s.t. } g_1(x) = -x_1^2 + x_2 \geq 0$$
$$g_2(x) = x_1 \geq 0.$$