Assignment (OPTIMIZATION TECHNIQUES)

I Find an optimal solution to : max $(z_1 - z_2)$ subject to $-2z_1 + z_2 \leq 2$, $z_1 - 2z_2 \leq 2$ and $z_1 + z_2 \leq 5$, z_1, z_2 real numbers.

II Find the maximum of $2z_1 + 3z_2$ subject to $4z_1 + 2z_2 + z_3 = 4$ and $z_1 + 3z_2 = 5$

III Minimize $x_1 - 3x_2$ subject to

$$-x_1 + 2x_2 + x_3 = 6$$

$$x_1 + x_2 + x_4 = 5$$

$$x_1, x_2, x_3, x_4 \geq 0$$

IV Show that $C = \{x : Ax \leq 0\}$ where A is an $m \times n$ matrix, has at most one extreme point namely, the origin

V Find an extreme point and a direction when $S = \{(x_1, x_2) : x_1 + 2x_2 \geq 2, -x_1 + x_2 = 4, x_1, x_2 \geq 0\}$

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