

§4.1: STANDARD FORM

- 1.] REDDY MIKKS COMPANY: Recall the Reddy Mikks company (Section 3.2) that produces both interior and exterior paints from two raw materials. Below is the original LP formulation:

$$\text{Maximize:} \quad z = 5x_1 + 4x_2$$

$$\text{Subject to:} \quad 6x_1 + 4x_2 \leq 24$$

$$x_1 + 2x_2 \leq 6$$

$$-x_1 + x_2 \leq 1$$

$$x_2 \leq 2$$

$$x_1, x_2 \geq 0$$

Convert the problem to standard form and determine the number of equations, m , and the number of variables n . Determine the matrix A and the vectors \mathbf{x} and \mathbf{b} .

- 2.] HEART VALVES: Recall U.S. Labs company that manufactures mechanical heart valves from the heart valves of pigs (Section 3.4). Below is the original LP formulation:

$$\text{Maximize: } z = 5x_1 + 4x_2 + 3x_3$$

$$\text{Subject to: } .40x_1 + .30x_2 + .20x_3 \geq 500$$

$$.40x_1 + .35x_2 + .20x_3 \geq 300$$

$$.20x_1 + .35x_2 + .60x_3 \geq 300$$

$$x_1 \leq 700$$

$$x_2 \leq 700$$

$$x_3 \leq 700$$

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

Convert the problem to standard form and determine the number of equations, m , and the number of variables n . Determine the matrix A and the vectors \mathbf{x} and \mathbf{b} .