

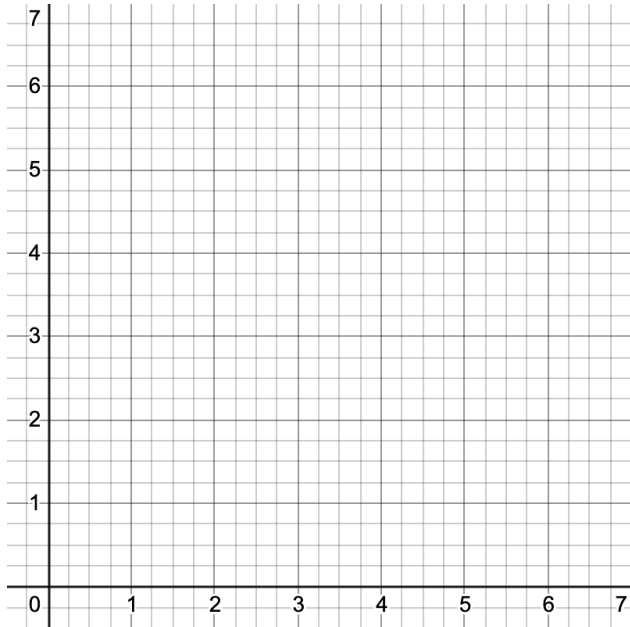
### §3.2 (PART 1): TWO VARIABLE LP MODELS

- 1.] THE REDDY MIKKS COMPANY: The Reddy Mikks company produces both interior and exterior paints from two raw materials,  $M_1$  and  $M_2$ . The following table summarizes the basic data of the problem:

	Tons of raw material per ton of		Maximum daily
	<i>Exterior Paint</i>	<i>Interior Paint</i>	availability (tons)
Raw Material, $M_1$	6	4	24
Raw Material, $M_2$	1	2	6
Profit per ton (\$1000)	5	4	

The daily demand for interior paint cannot exceed that for exterior paint by more than 1 ton. Further, the maximum daily demand for interior paint is 2 tons. Reddy Mikks wishes to determine the optimal product mix of interior and exterior paints that maximizes daily profits. Formulate the mathematical model.

- 2.] In the figure below, sketch the feasible space for the Reddy Mikks problem, and determine the optimal solution to the LP problem.



- 3.] Is the point  $x_1 = 2$  and  $x_2 = 2$  a feasible solution? What is the daily profit? Determine the unused amounts of raw materials,  $M_1$  and  $M_2$ .
- 4.] Suppose that Reddy Mikks sells its exterior paint to a single wholesaler at a quantity discount. The profit per ton is \$5000 if the contractor buys no more than 2 tons daily and \$4500 otherwise. Express the objective function mathematically. Is the resulting function linear?