Name: _____
MATH 108
Fall 2021
HW 6: Due 11/04

"I used to sell furniture for a living. The trouble was, it was my own."
–Les Dawson

Problem 1. (10pt) As accurately as possible, sketch the feasible region given by the following maximization problem:

$$\begin{aligned} \max z = 4x_1 + 6x_2 \\ x_1 + x_2 \leq 10 \\ 2x_1 - x_2 \geq 2 \\ x_1, x_2 \geq 0 \end{aligned}$$

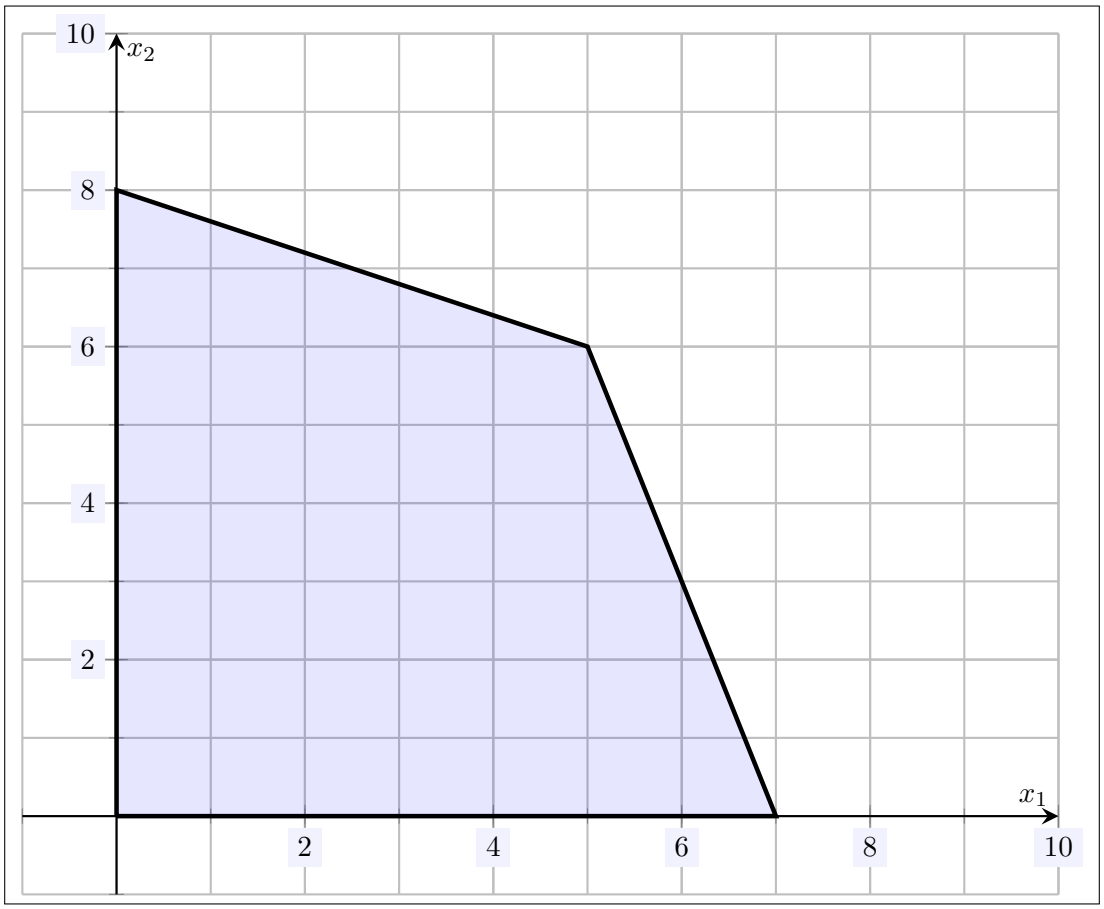
Is this region bounded or unbounded?

Problem 2. (10pt) As accurately as possible, sketch the feasible region given by the following minimization problem:

$$\begin{aligned} \min z &= x_1 - 3x_2 \\ x_1 + x_2 &\geq 4 \\ \frac{1}{2}x_1 + 3x_2 &\geq 7 \\ x_1, x_2 &\geq 0 \end{aligned}$$

Is this region bounded or unbounded?

Problem 3. (10pt) Find a system of inequalities that gives the following feasible region:



Problem 4. (10pt) Use the Fundamental Theorem of Linear Programming, i.e. the Corner-Point Method, to find the maximum and minimum values for z given the following definition of z and constraints:

$$z = -2x_1 + 5x_2$$
$$-x_1 + x_2 \leq 4$$
$$4x_1 + x_2 \leq 24$$
$$x_1, x_2 \geq 0$$