

**Learning Objectives**

- To graph and solve a linear programming problem given a set of constraints
- To run the branch and bound algorithm to find IP solutions

**Q1. Linear Programming**

Below is a 2D linear programming (LP) problem. Rewrite it in inequality form with the matrices  $A$ ,  $b$ , and  $c$ . Graph the constraints and the cost vector and find the solution.

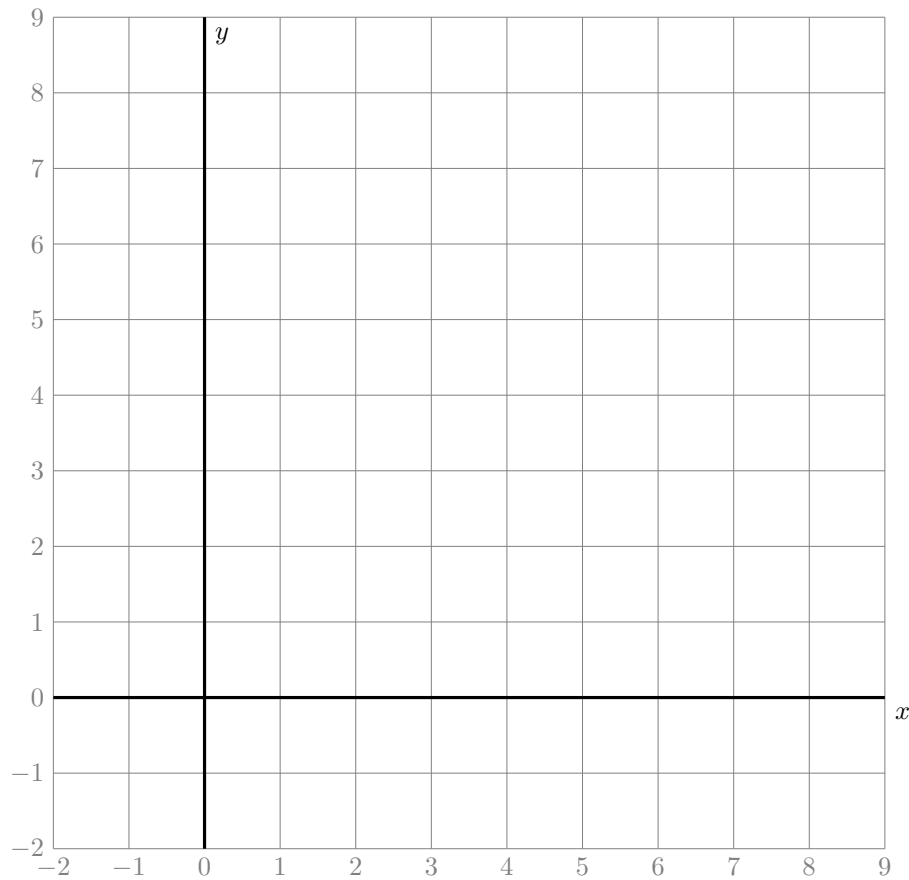
$$\max_{x,y} x + 3y$$

$$1.4x + y \geq 4.58$$

$$1.56x - y \leq 3.42$$

$$1.9x + y \leq 12.16$$

$$0.44x - y \geq -4.21$$



## Q2. Branch and Bound

Now consider the problem as an IP problem. Using the branch and bound algorithm described in lecture to find the integer solution. Remember to have your priority queue ordered by the objective value of each LP problem.

What is the IP solution?