

MA 162: Finite Mathematics - Sections 3.1/3.2

Fall 2014

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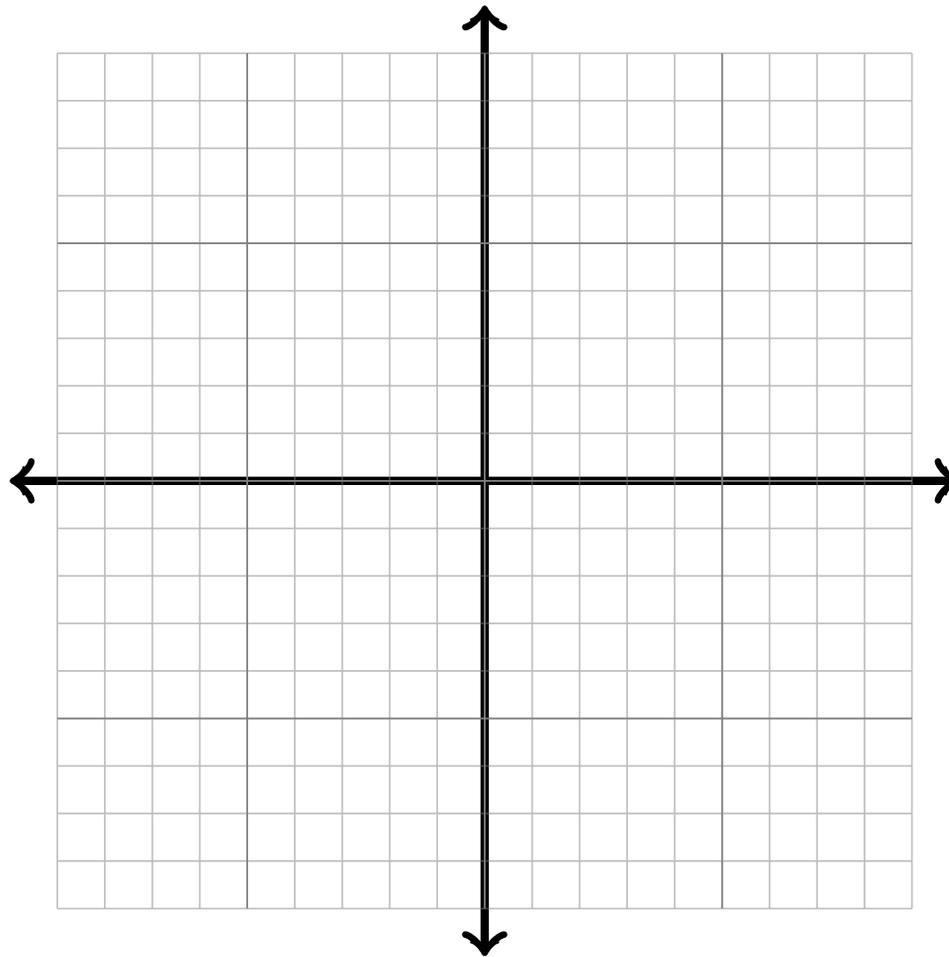
Announcements:

- Homework 2.6 due Tuesday at 6pm.
- Homework 3.1/3.2 due Friday at 6pm (will be posted today).

Graphing Inequalities

- Graph the solution to the inequality

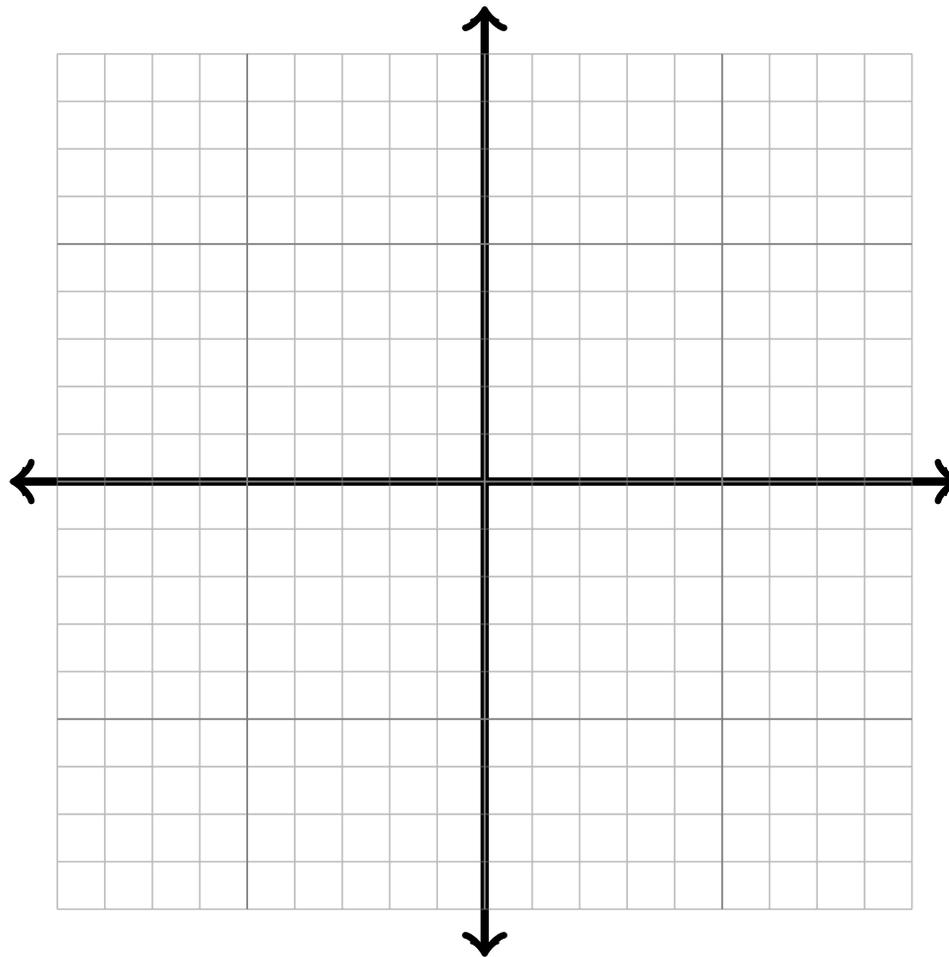
$$x < 4$$



Graphing Inequalities (Tan 3.1 #10)

- Graph the solution to the inequality

$$5x - 3y \geq 15$$

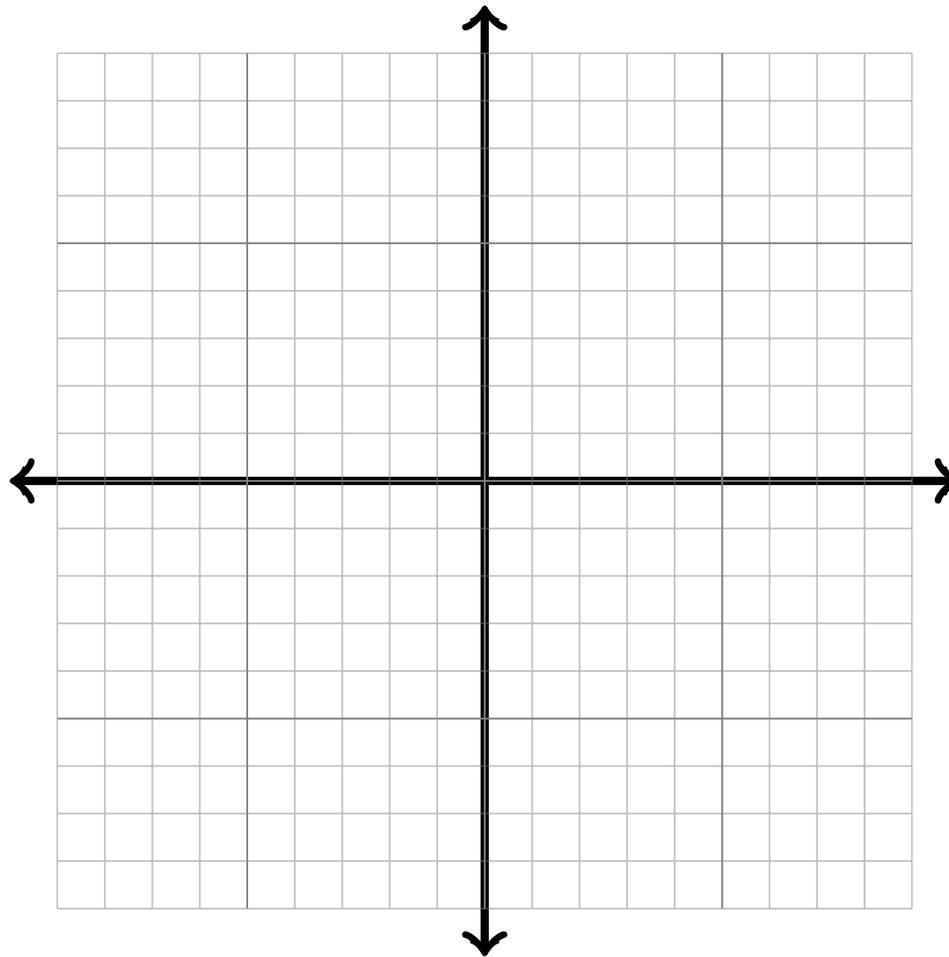


Graphing a System of Inequalities (Tan 3.1 #24)

- Graph the solution to the system of inequalities

$$3x - 2y > -13$$

$$-x + 2y > 5$$



Graphing a System of Inequalities (Tan 3.1 #36)

- Graph the solution to the system of inequalities

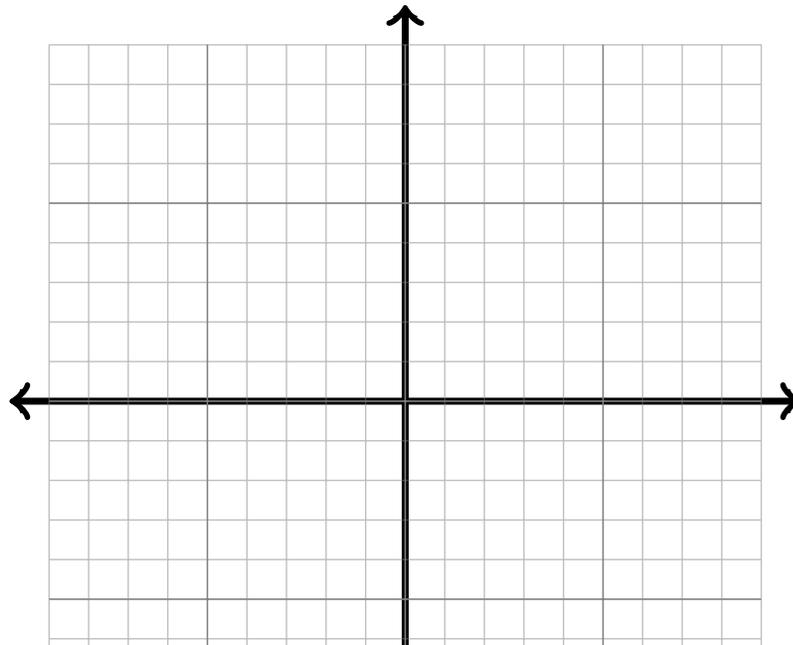
$$x + y \leq 4$$

$$2x + y \leq 6$$

$$2x - y \geq -1$$

$$x \geq 0$$

$$y \geq 0$$



3.2 - Linear Programming Problems

A linear programming problem consists of:

- An objective function (what are we trying to maximize/minimize?)
- Constraints (linear equalities or inequalities)

The goal of a linear programming problem is to maximize or minimize the objective function while satisfying all the constraints.

Setting up a Linear Programming Problem (Tan 3.2 #14)

A farmer uses two types of fertilizers. A 50-lb bag of Fertilizer A contains 8 lb of nitrogen, 2 lb of phosphorus, and 4 lb of potassium. A 50-lb bag of Fertilizer B contains 5 lbs each of nitrogen, phosphorus, and potassium. The minimum requirements for a field are 440 lb of nitrogen, 260 lb of phosphorus, and 360 lb of potassium. If a 50-lb bag of Fertilizer A costs \$30 and a 50-lb bag of Fertilizer B costs \$20, find the amount of each type of fertilizer the farmer should use to minimize his cost while still meeting the minimum requirements.

Setting up a Linear Programming Problem (Tan 3.2 #24)

A financier plans to invest up to \$2 million in three projects. She estimates that Project A will yield a return of 10% on her investment, Project B will yield a return of 15% on her investment, and Project C will yield a return of 20% on her investment. Because of the risks associated with the investments, she decided not to put more than 20% of her total investment in Project C. She also decided that her investments in Projects B and C should not exceed 60% of her total investment. Finally, she decided that her investment in Project A should be at least 60% of her investments in Projects B and C. How much should the financier invest in each project if she wishes to maximize the total returns on her investments?