

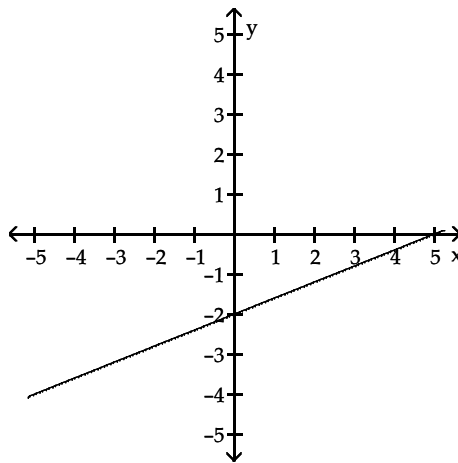
M118 SECTION 5.1–5.2 – SYSTEMS OF LINEAR INEQUALITIES

1) Procedure for Graphing an inequality: such as $Ax + By > C$

- 1) First graph the line $Ax + By = C$ (Use a dashed line if equality is not included, a solid line if inequality is included)
- 2) Choose a test point (not on the line – choose $(0,0)$ if it is available) and substitute it into the inequality.
- 3) Shade the half plane including the point if the inequality is satisfied. Shade the opposite half plane if the the point does not satisfy the inequality.

Example 1: $2x - 5y < 10$

$$\begin{array}{r|l} x & y \\ \hline 0 & -2 \\ 5 & 0 \end{array}$$



Example 2: Now consider systems of linear inequalities:

$$\begin{array}{l} 3x + y \leq 21 \\ x - 2y \leq 0 \end{array}$$

The intersection of the regions is called the solution or **feasible region**.

The intersection of two boundary lines is called a **corner point**.

Find the corner point(s) for Example 2.

Example 3: Solve and find the corner points:

$$5x + y \geq 20$$

$$x + y \geq 12$$

$$x + 3y \geq 18$$

$$x \geq 0$$

$$y \geq 0$$

Example 4: Solve and find the corner points

$$x + y \leq 11$$

$$x + 5y \geq 15$$

$$2x + y \geq 12$$

Example:SECTION 5.2 # 40

A furniture manufacturing company manufactures dining room tables and chairs. A table requires 8 labor-hours for assembling and 2 labor-hours for finishing. A chair requires 2 labor hours for assembling and 1 labor-hour for finishing. The maximum labor hours available every day for assembling and finishing are 400 and 120, respectively. If x is the number of tables and y is the number of chairs produced per day, write a system of linear inequalities that indicates appropriate restraints on x and y . Find the set of feasible solutions graphically for the number of tables and chairs produced.