

7.3.D1 - SYSTEMS OF 2+ LINEAR INEQUALITIES

Define variables and write a system of inequalities to represent each situation. Refer to the 7.3 example "Writing a System of More Than Two Inequalities" in the Chapter 7 Summary.

1. A company manufactures at most 20 mattresses each day. The company produces a twin size mattress and a queen size mattress. Its daily production goal is to produce at least 5 of each type of mattress.

Do either of these apply?

$$x \geq 0 \quad y \geq 0$$

System of inequalities:

Let $x =$ _____ &

Let $y =$ _____

2. A company manufactures calculators. A financial calculator costs \$65 to make and a graphing calculator costs \$105 to make. The budget available for materials is \$2500 per day. The manufacturing capacity is 20 calculators per day.

Do either of these apply?

$$x \geq 0 \quad y \geq 0$$

System of inequalities:

Let $x =$ _____ &

Let $y =$ _____

3. A furniture company manufactures sofas and loveseats. A loveseat takes 5 hours and \$650 to make. A soft takes 8 hours and \$940 to make. The company's employees work a total of 240 hours in a day. The daily operating budget is \$25,000 per day for materials to make at least 40 pieces of furniture.

Do either of these apply?

$$x \geq 0 \quad y \geq 0$$

System of inequalities:

Let $x =$ _____ &

Let $y =$ _____

4. A company manufactures golf clubs. A putter takes 2 hours and \$80 to make. A driver takes 2 hours and \$120 to make. The company's employees work a total of 72 hours in a day. The daily operating budget is \$3000 per day for materials. The company wants to make at least 10 of each kind of club.

Do either of these apply?

$$x \geq 0 \quad y \geq 0$$

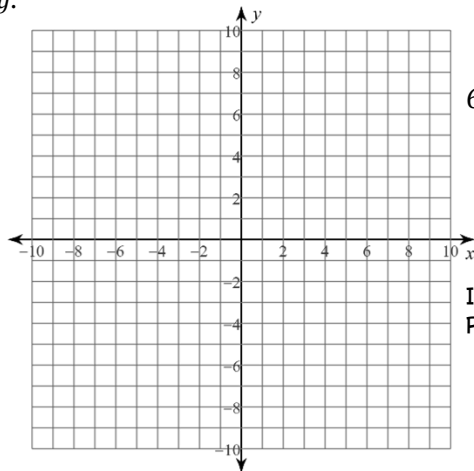
System of inequalities:

Let $x =$ _____ &

Let $y =$ _____

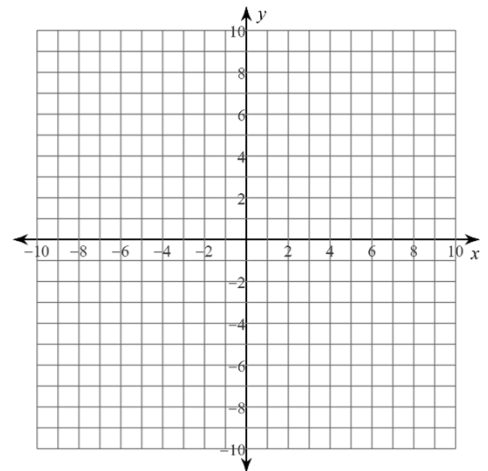
Graph the solution set for each system of linear inequalities. Identify all points of intersection of the boundary lines. Refer to the 7.3 example "Solving a System of More Than Two Inequalities by Graphing" in the Chapter 7 Summary.

5. $y \leq 4$
 $2x - y \leq 10$
 $y > -x - 4$



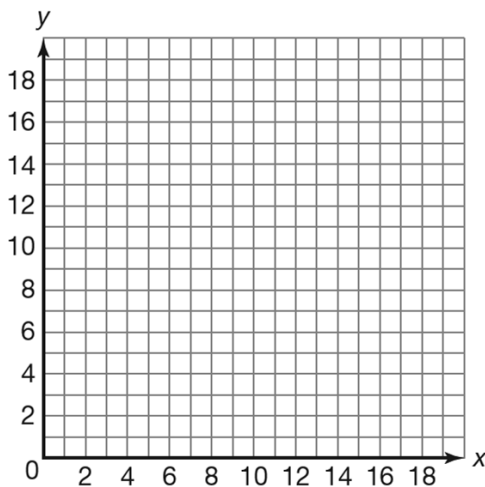
INTERSECTION POINTS:

6. $y > -4$
 $y \leq x + 1$
 $-x \leq y + 3$
 $y \leq -x + 6$



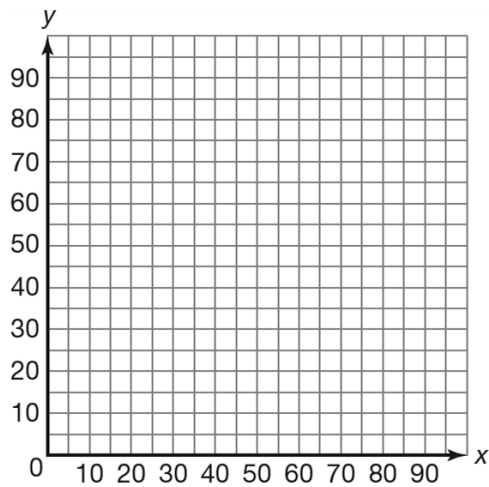
INTERSECTION POINTS:

$$\begin{aligned}
 &y \geq 3 \\
 &x \geq 0 \\
 7. \quad &x + y \leq 20 \\
 &2x - 3y \geq -15
 \end{aligned}$$



INTERSECTION POINTS:

$$\begin{aligned}
 &y \geq 10 \\
 &x \geq 20 \\
 8. \quad &x + y \leq 90 \\
 &x + 4y \leq 240
 \end{aligned}$$



INTERSECTION POINTS:

Solve each system of equations using the appropriate method: substitution or linear combinations. Write your solution as an ordered pair (x, y) . Refer to the 6.1 example "Solving Systems of Linear Equations Using the Substitution Method" or the 6.2 example "Solving a System of Equations Using the Linear Combinations Method" in the Chapter 6 Summary.

$$\begin{aligned}
 9. \quad &-8x - 10y = -20 \\
 &y = 6
 \end{aligned}$$

$$\begin{aligned}
 10. \quad &8x + 3y = -14 \\
 &8x + 5y = -2
 \end{aligned}$$

$$\begin{aligned}
 11. \quad &x = 3y - 3 \\
 &4x - 9y = -6
 \end{aligned}$$

$$\begin{aligned}
 12. \quad &2x - 2y = 26 \\
 &4x + 8y = 16
 \end{aligned}$$