Name _____ Period_____

1. Identify three points that are solutions to each system.

a. $\begin{cases} y \ge 0.75x \\ y \le 2x - 7 \end{cases}$ Answers will vary.

(8, 8), (9, 7), (10, 9)

$8 \ge 0.75(8)$	$7 \ge 0.75(9)$	$9 \ge 0.75(10)$
$8 \ge 6$	$7 \ge 6.75$	$9 \ge 7.5$

$8 \le 2(8) - 7$	$7 \le 2(9) - 7$	$9 \le 2(10) - 7$
$8 \le 9$	$7 \le 11$	$9 \le 13$

b. $\begin{cases} y < 0.5x - 2 \\ y > -0.25x + 3 \end{cases}$
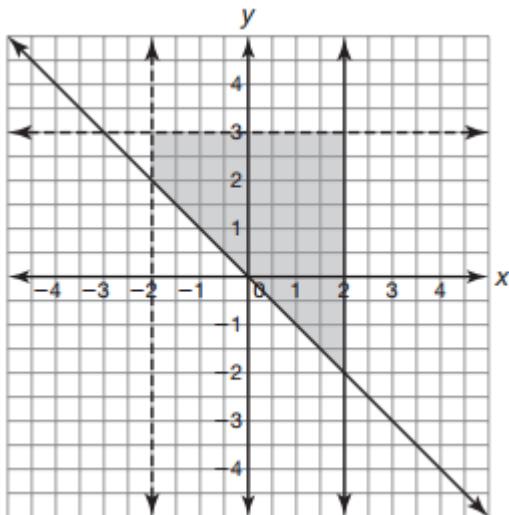
Answers will vary.

(15, 3), (12, 2), (10, 1)

$3 < 0.5(15) - 2$	$2 < 0.5(12) - 2$	$1 < 0.5(10) - 2$
$3 < 5.5$	$2 < 4$	$1 < 3$

$3 > -0.25(15) + 3$	$2 > -0.25(12) + 3$	$1 > -0.25(10) + 3$
$3 > -0.75$	$2 > 0$	$1 > 0.5$

2. Write a system of linear inequalities that is represented by the graph.

$\begin{cases} x > -2 \\ x \le 2 \\ y < 3 \\ y \ge -x \end{cases}$

3. Tell whether the graph of each inequality would be represented with a dashed line or solid line.

a. $y < 14 - 7x$

dashed line

b. $y + 9 \ge 3$

solid line

4. A company produces CDs and DVDs. There is an expected demand of at least 5000 CDs and 8000 DVDs each day. A total of at most 20,000 items are produced each day. Write a system of linear inequalities to represent the constraints of this situation. Let x represent the number of CDs and y represent the number of DVDs.

$\begin{cases} x + y \le 20{,}000 \\ x \ge 5000 \\ y \ge 8000 \end{cases}$

5. Graph the solution to this system of linear inequalities.

$$\begin{cases} y \geq -x + 3 \\ y \leq \frac{1}{4}x - 2 \\ x < 8 \end{cases}$$
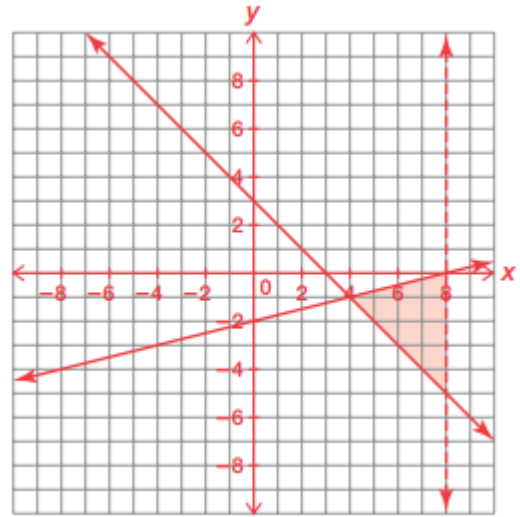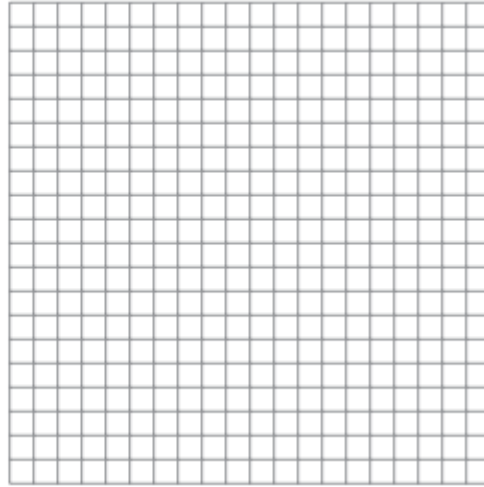
6. A company prints flyers and brochures. It takes 2 minutes to print a flyer and 4 minutes to print a brochure. Each flyer uses 12 ounces of ink and each brochure uses 9 ounces of ink. The company has 2 hours available and 360 ounces of ink. The company makes a profit of $1 on each flyer and $2 on each brochure. The company cannot print a negative number of flyers or brochures.

   a. Let x represent the number of flyers and y represent the number of brochures. Write a system of inequalities to represent the constraints of this problem situation.

   $$\begin{cases} x \geq 0 \\ y \geq 0 \\ 2x + 4y \leq 120 \\ 12x + 9y \leq 360 \end{cases}$$

   b. Graph the system of inequalities. Then write and solve an equation to determine how many flyers and brochures the company should print in order to maximize their profit.

   $P(x, y) = x + 2y$

   $P(0, 30) = 0 + 2(30) = 60$

   $P(12, 24) = 12 + 2(24) = 60$

   $P(30, 0) = 30 + 2(0) = 30$

   The company can maximize their profit by printing either 12 flyers and 24 brochures or 0 flyers and 30 brochures.
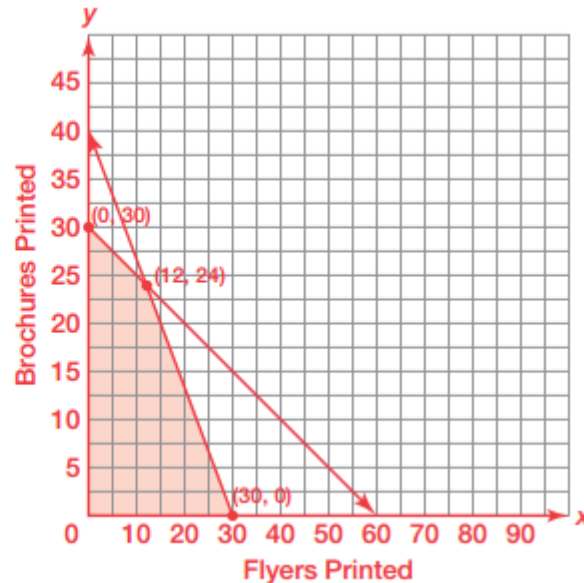
7. Wanda sews small and large gloves. It takes her 45 minutes to sew a small pair of gloves and 120 minutes to sew a large pair of gloves. The costs of producing the gloves are $2 for a small pair and $4 for a large pair. Wanda has 16 hours available to sew gloves. The materials to make the gloves must cost at most $40. The system of linear inequalities represents this situation.

$$\begin{cases} 45x + 120y \leq 960 \\ 2x + 4y \leq 40 \end{cases}$$

What does the solution (16, 2) represent?

The solution (16, 2) is the point where the system of equations intersects. Wanda can make 16 pairs of small gloves and 2 pairs of large gloves and remain at a cost of $40 in 16 hours.