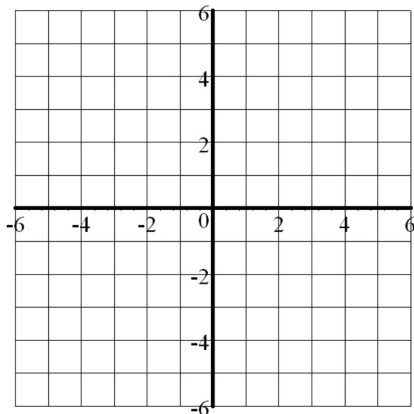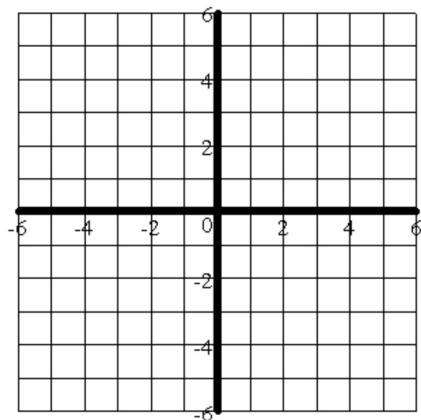Graph each system of inequalities. Shade the solution region with a highlighter or a colored pencil.

1. $y > -\frac{1}{2}x + 4$

   $4x - 8y \le -24$

2. $x \ge 2$
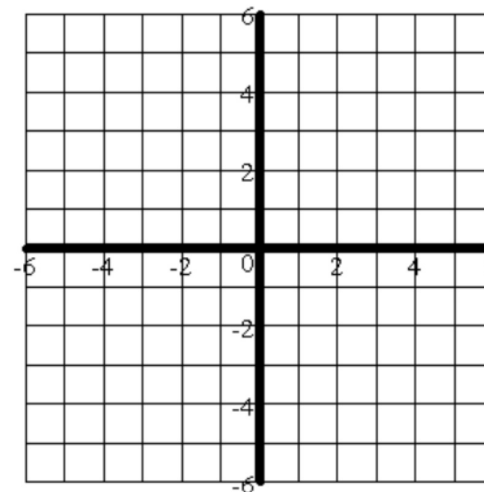
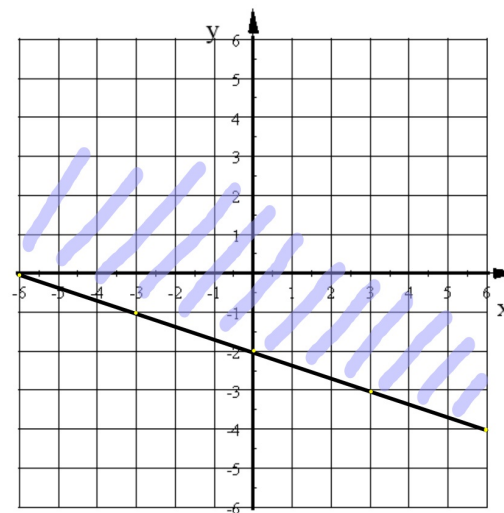 $y < \frac{1}{4}x$

3. $10x + 5y > 20$

   $12x + 6y \le -12$

4. Model this graph with an inequality.

Solve each system of equations.

1. $m - n = 7$
   $4m + 3n = 35$

2. $3P - 8Q = 7$
   $5P - 6Q = -3$

3. Find the solution to this system of equations by graphing.
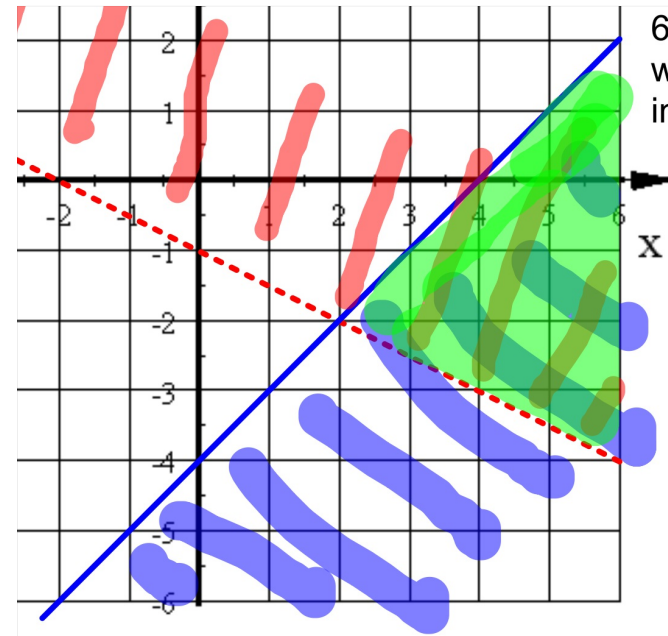
   $y = 2x+6$

   $10x+ 5y = 10$
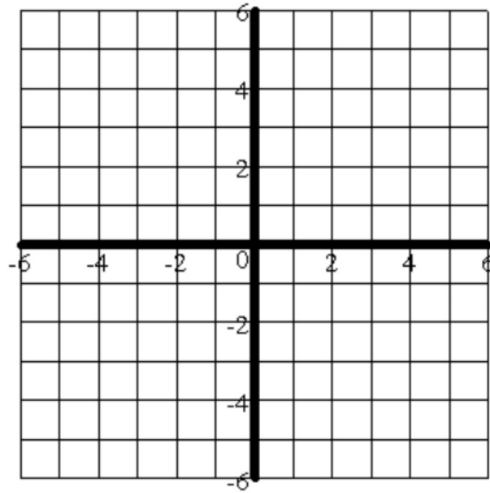
4. One elementary school has 450 students but has been decreasing by 12 students each year. Another elementary school has 398 students and is increasing by 8 students each year. Write and solve a system of equations to find the number of years it will take for the two elementary schools to have the same number of students.

5. The grocery store got a delivery of 39 boxes of food. Inside each small box is 16 cans. Inside each large box is 24 cans. When all the boxes were opened there was a total of 768 cans of food. Write and solve a system of equations to find the number of small and large boxes.

# of small boxes

# of large boxes

6. Model this graph with a system of inequalities.

7. You fly roundtrip between two cities that are 1200 miles apart. On the first trip you fly with a tailwind in 8 hours. On the return trip you took 10 hours because of a headwind. Write and solve a system of equations to find the speed of the plane and the speed of the wind.

8. You start a carpet cleaning business. To begin you must spend $28,000 on equipment. Each cleaning job costs $8 in supplies and $45 in wages. If you charge $99 per job find the number of jobs you must complete in order to break-even.

9. Without graphing tell if each system of equations has ONE, NONE, or MANY solutions.

a) $y = -2x - 9$

$10x - 5y = 45$

b) $y = -3x$

$-3x + y = 7$

b) $y = -3x + 1$

$4x - y = 13$

10. Solve the system of equations.

a) $2x + 2y = 32$

$-5x + 6y = -25$

11. Rewrite both of these equations into slope-intercept form then solve this system of equations using the Substitution method!

$4x + 3y = -4$

$5x + 6y = 13$