Math Applications
Section 7.2 Notes
Systems of Linear Inequalities

Name: Key

Steps for solving a linear inequality:

1. Change the inequality to an equation **(*y=mx+b*)** and graph the line.
2. If the inequality contains a ≤ or ≥ sign, draw a **solid** line.
3. If the inequality contains a < or > sign, draw a **dotted** line.
4. Check to see if the point (0, 0) is a solution to the inequality. If it is, shade that side of the line, if it is not, shade the opposite side.
5. A solution to a **system of inequalities** must be true for **both** inequalities.

Practice Problems

Determine which points satisfy the given inequality.

1. $3x+4y \geq 2$

a). (3, 5) b). (1, -2)
c). (0, 0) d). (-4, 6)

2. $2x-4y \geq 5$

a). (5, 2) b). (6, 0)
c). (0, -3) d). (-2, 3)

3. $5y-3x < 2$

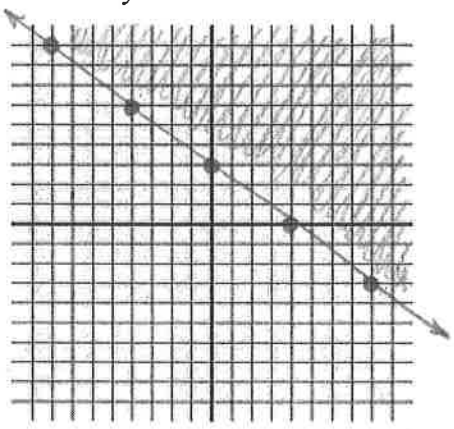
a). (2, 3) b). (1, 1)
c). (0, 0) d). (-3, -2)

4. $8x-y < 2$

a). (4, 6) b). (-1, -2)
c). (0, 0) d). (-4, 3)

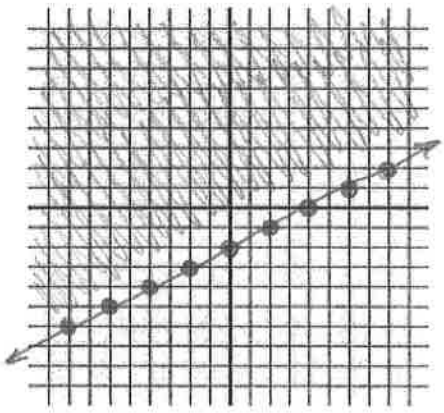
Solve each inequality by graphing and shading in the region that contains all solutions.

5. $3x+4y \geq 12$



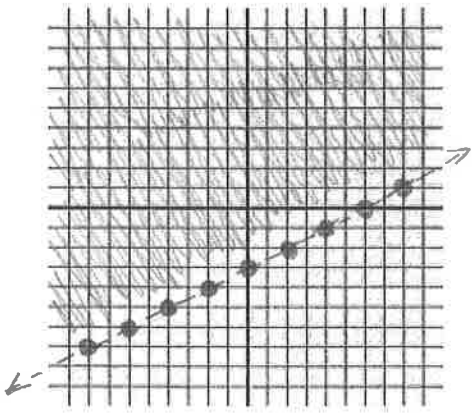
$3x+4y \geq 12$
$4y \geq -3x+12$
$y \geq -\frac{3}{4}x+3$

6. $2x-4y \leq 8$



$2x-4y \leq 8$
$-4y \leq -2x+8$
$y \geq \frac{1}{2}x-2$

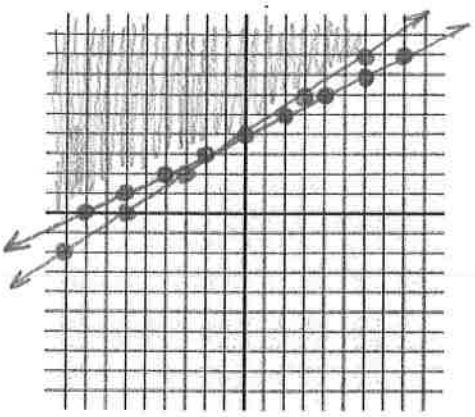
7. $2x-4y < 12$



$2x-4y < 12$
$-4y < -2x+12$
$y > \frac{1}{2}x-3$

Solve each system by graphing each line then shading the region that contains the solution set.

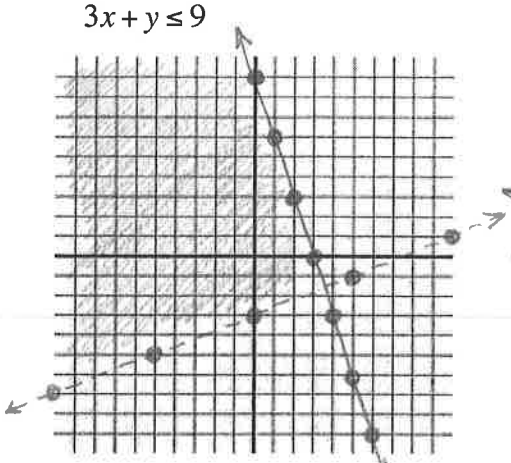
8. $2x-3y\le -12$
   $x-2y\le -8$



$2x-3y\le -12$ → $-3y\le -2x-12$ → $y\ge \frac{2}{3}x+4$

$x-2y\le -8$ → $-2y\le -x-8$ → $y\ge \frac{1}{2}x+4$

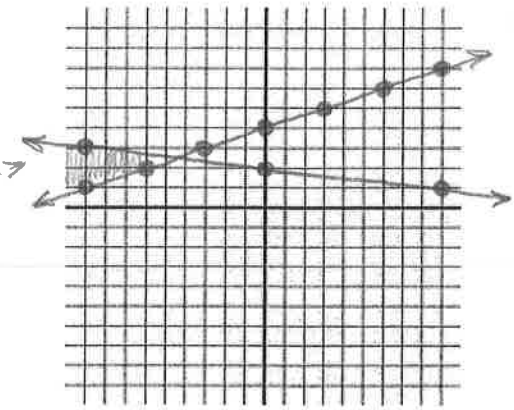
9. $2x-5y<15$
   $3x+y\le 9$



$2x-5y<15$ → $-5y<-2x+15$ → $y>\frac{2}{5}x-3$

$3x+y\le 9$ → $y\le -3x+9$

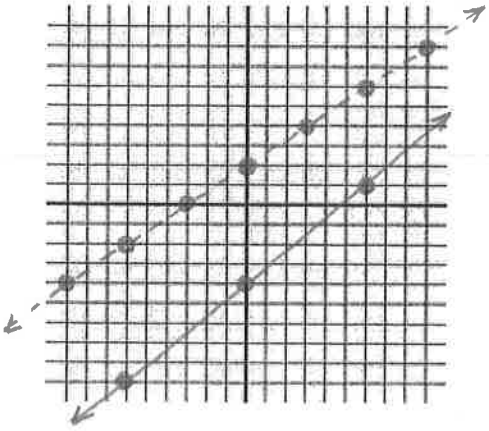
10. $3y\ge 12+x$
    $9y\le 18-x$



$3y\ge 12+x$ → $y\ge \frac{1}{3}x+4$

$9y\le 18-x$ → $y\le -\frac{1}{9}x+2$

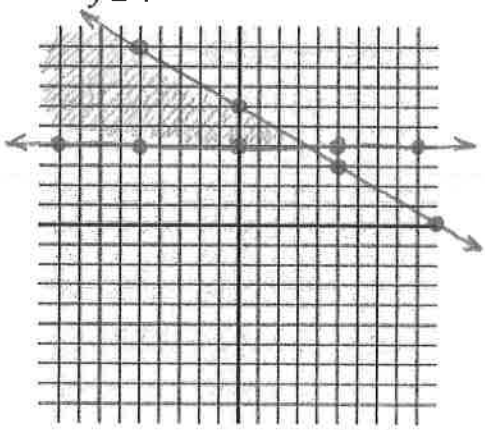
11. $5x-6y\ge 24$
    $3y-6<2x$



$5x-6y\ge 24$ → $-6y\ge -5x+24$ → $y\le \frac{5}{6}x-4$

$3y-6<2x$ → $3y<2x+6$ → $y<\frac{2}{3}x+2$

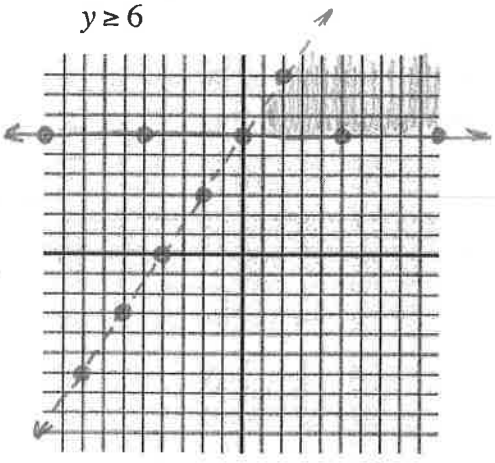
12. $3x+5y\le 30$
    $y\ge 4$



$3x+5y\le 30$ → $5y\le -3x+30$ → $y\le -\frac{3}{5}x+6$

$y\ge 4$

13. $-3x+2y<12$
    $y\ge 6$



$-3x+2y<12$ → $2y<3x+12$ → $y<\frac{3}{2}x+6$

$y\ge 6$