# 9.7 Exercise Set

Graph.

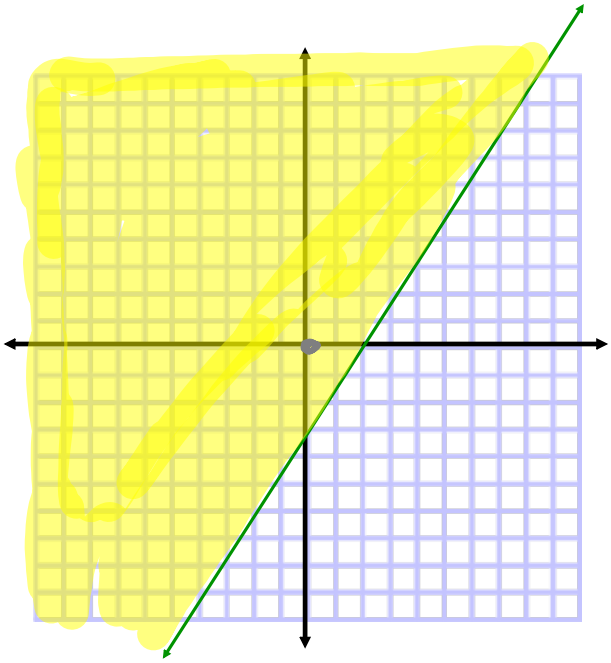
since we allow equality, draw solid line

17. $3x - 2y \leq 6$

Solve for y: $3x - 2y = 6$

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

$y = \frac{3}{2}x - 3$



test point: (0,0)

plug into $3x - 2y \leq 6$

$3(0) - 2(0) \leq 6$

$0 \leq 6$ (true)

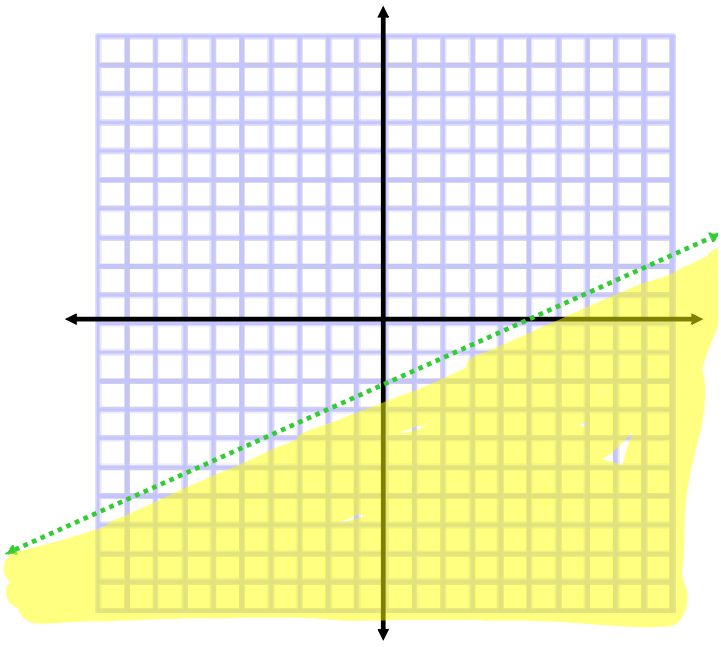
dashed since we do not allow equality

18. $2x - 5y > 10$

Solve for y: $2x - 5y = 10$

$\frac{-5y}{-5} = \frac{-2x + 10}{-5}$

$y = \frac{2}{5}x - 2$



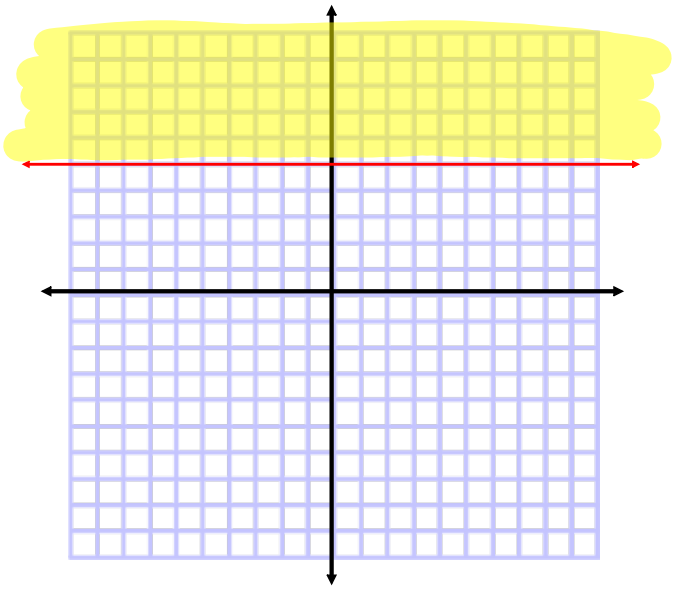
test point: (0,0)

$2(0) - 5(0) > 10$

$0 > 10$ (false)

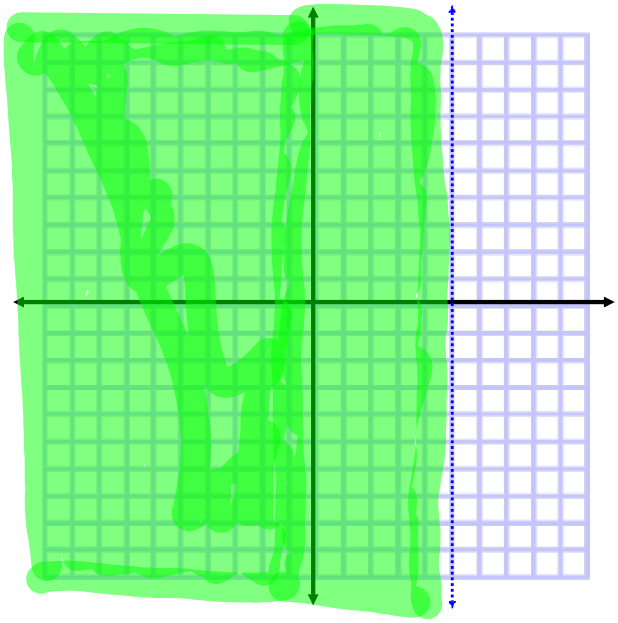
25. $y \geq 5$

note: $y = 5$ is the equation of a horizontal line

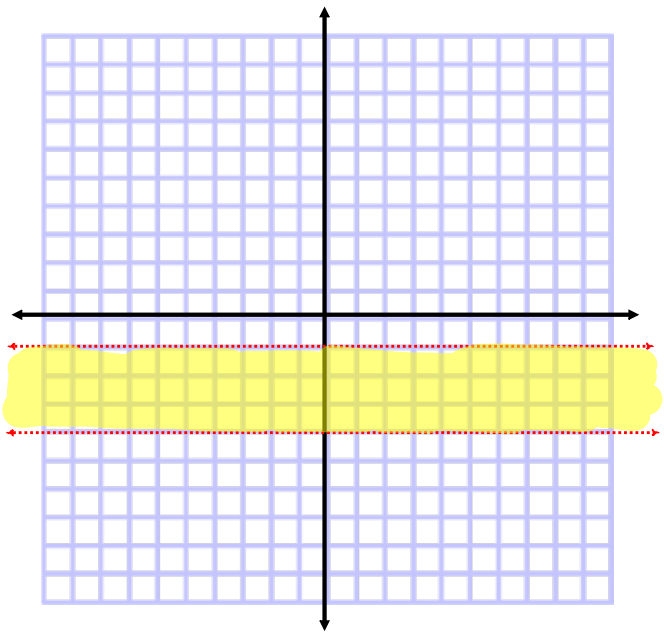


26. $x < 5$

note: $x = 5$ is the equation of a vertical line



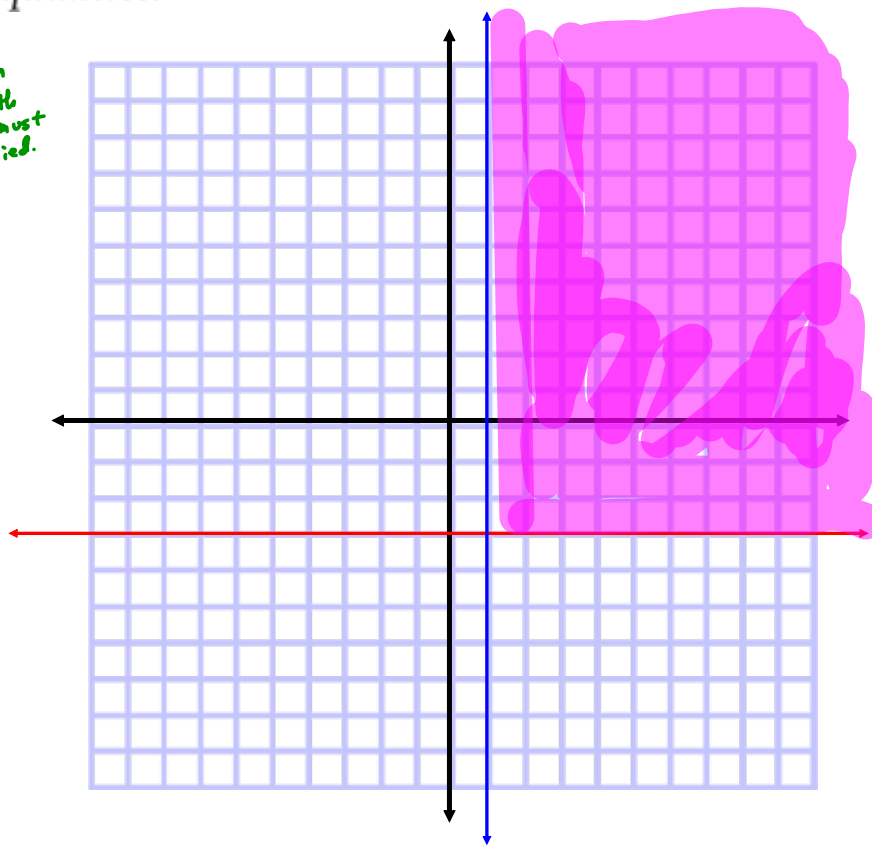
27. $-4 < y < -1$



*Graph the system of inequalities.*

47. $y \geq -3$,
$x \geq 1$

this is an "AND". Both conditions must be satisfied.



53. • $2y - x \leq 2$,
• $y + 3x \geq 0$

• Solve for y: $2y - x = 2$

$\frac{2y}{2} = \frac{x+2}{2}$

$y = \frac{1}{2}x + 1$

test pt: (0,0) below red line

$2(0) - 0 \leq 2$

$0 \leq 2$ (true)

• Solve for y: $y + 3x = 0$

$y = -3x$

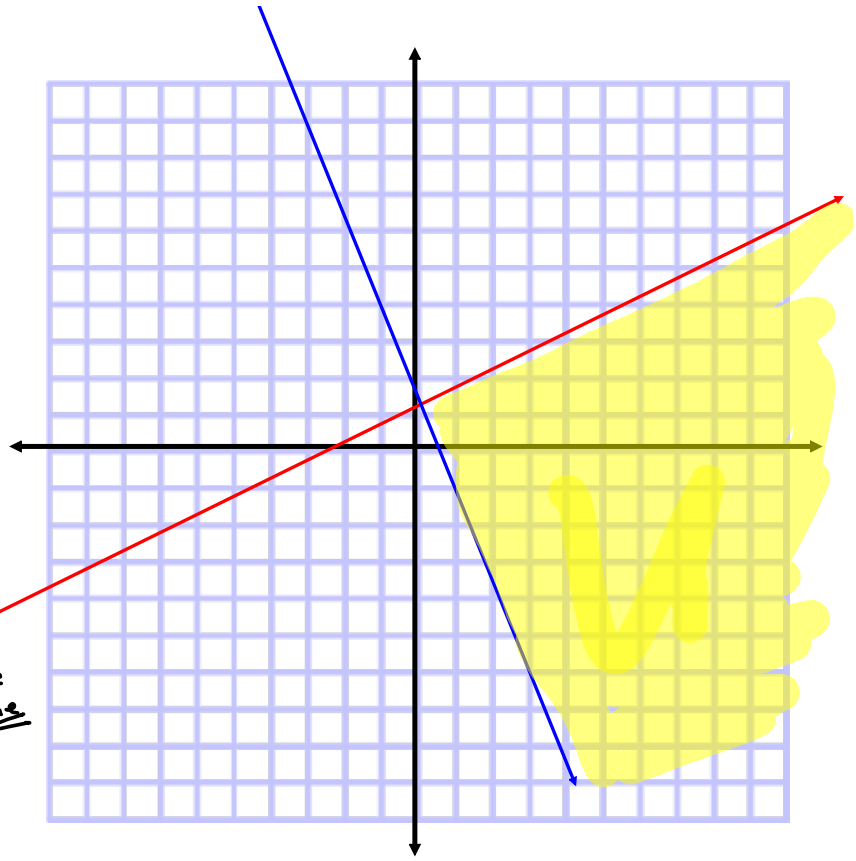
$m = \frac{-3}{1}$, $b = 0$

test pt: (1,1) right of blue line

$1 + 3(1) \geq 0$

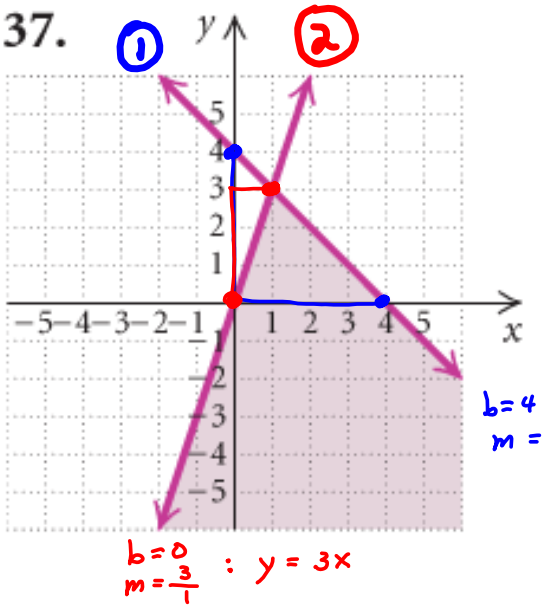
$1 + 3 \geq 0$

$4 \geq 0$ (true)



*Find a system of inequalities with the given graph. Answers may vary.*

**37.**



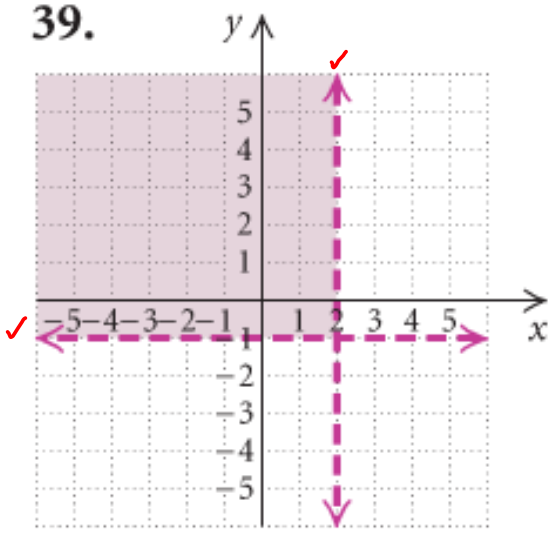

b = 4
$m = \frac{-4}{4} = -1$ : $y = -x + 4$

b = 0
$m = \frac{3}{1}$ : $y = 3x$

① $y \leq -x + 4$

② $y \leq 3x$

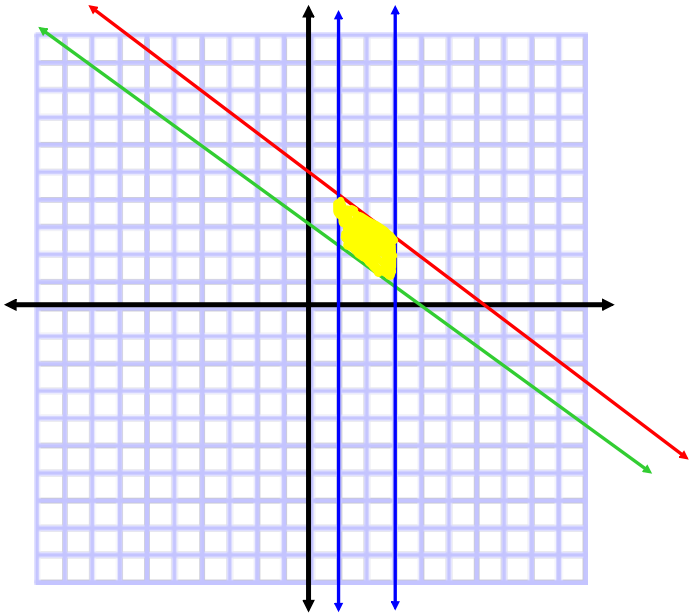
**39.**




$x < 2$

$y > 1$

**59.** • $3x + 4y \geq 12$,
• $5x + 6y \leq 30$,
• $1 \leq x \leq 3$ between the blue line



• Solve for y: $3x + 4y = 12$

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

$y = -\frac{3}{4}x + 3$

test pt: (0,0)

$3(0) + 4(0) \geq 12$

$0 \geq 12$ (false)

above green line

• Solve for y: $5x + 6y = 30$

$\frac{6y}{6} = \frac{-5x+30}{6}$

$y = -\frac{5}{6}x + 5$

test pt: (0,0)

$5(0) + 6(0) \leq 30$

$0 \leq 30$ (true)

below red line