

GUIDED NOTES: Solve Systems of Inequalities by Graphing

To solve a system of inequalities, we need to find the ordered pairs that satisfy all of the inequalities of the system. The solution is their overlapping section.

Solid Line

Dotted Line

Shade Above

Shade Below

Which one faces y.

\geq \leq

$>$ $<$
(no equal)

\geq $>$
(greater)

\leq $<$
(less)

(equal to)

EX1. Solve the system of inequalities by graphing:

$y > -2x + 4$

$y \leq x - 2$

y-int: $\frac{-2}{-2}$

Slope: $\frac{1}{1}$

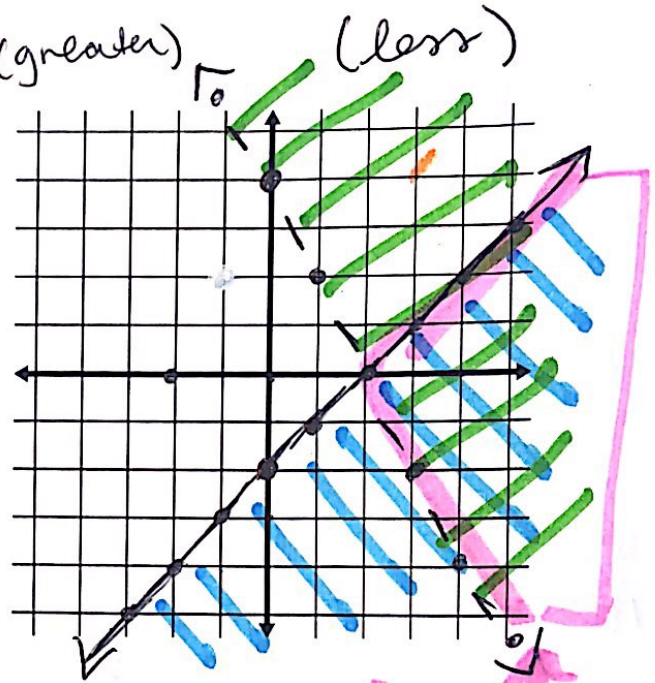
Solid line
shade below

$y > -2x + 4$

y-int: 4

Slope: $\frac{-2}{1}$

dotted line
above



EX2. Solve the system of inequalities by graphing:

$3x + y \leq 4$

$x - 2y > -4$

$-x - 2y > -4$

$\frac{-2y}{-2} > \frac{-x-4}{-2}$

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

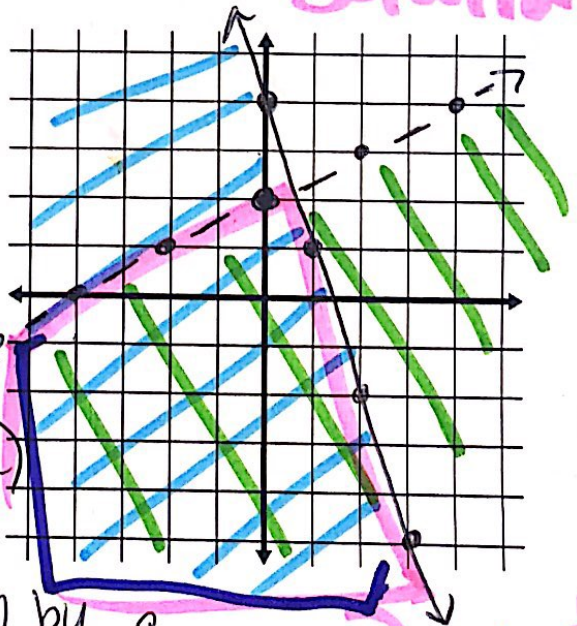
y-int: 2
Slope: $\frac{1}{2}$
dotted below

$y \leq 4 - 3x$

y-int: 4

Slope: $\frac{-3}{1}$

Solid line
below (shade)



*When dividing by a negative #, our inequality flips!

EX3. Solve the system of inequalities by graphing:

$$\begin{aligned} -y &> x \\ y &\leq 3 \\ x &\leq 5 \end{aligned}$$

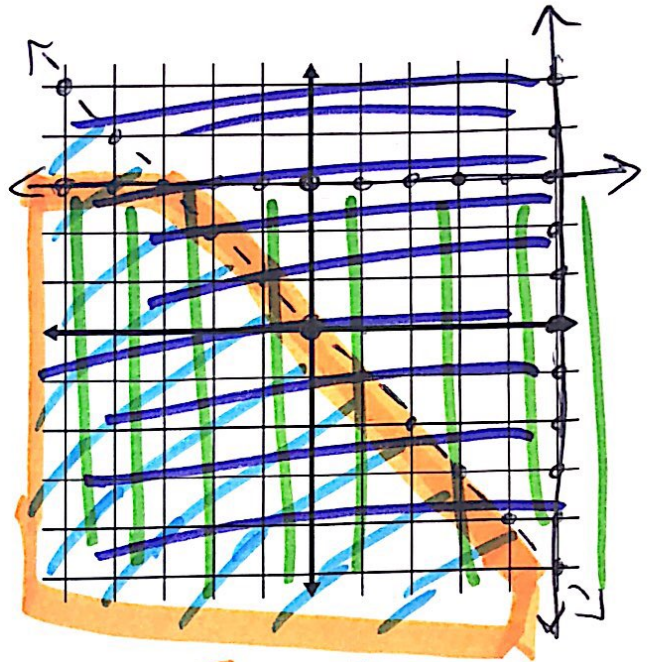
$$\frac{-y}{-1} > \frac{x}{-1}$$

$$y < -x + 0$$

y-int: 0
dotted
below

$x \leq 5$
Solid

$y \leq 3$
Solid
below

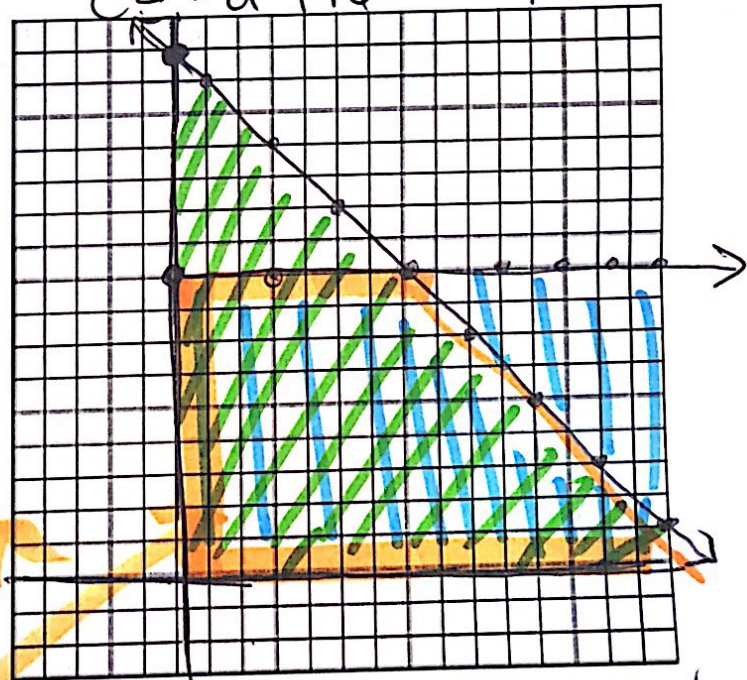


Solution

EX4. Sarah's Pet Store never has more than a combined total of 16 cats and dogs. She also never has more than 9 cats. Write a system of inequalities and graph to show the possible number of cats and dogs in her store.

$$\begin{aligned} d + c &\leq 16 \rightarrow c \leq 16 - d && \text{x-int: } 16 \\ & && \text{Slope: } -1/1 \\ c &\leq 9 \end{aligned}$$

dog = x
cats = y



Solution

* don't want negative pets!