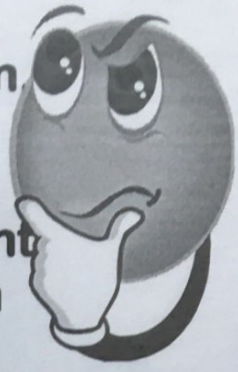
Graphing an Inequality

1. Solve the inequality for y (if necessary). Graph each inequality on the same set of axes.
2. Graph the inequality as if it contained an = sign
3. Draw the line solid if the inequality is $\leq$ or $\geq$
4. Draw the line dashed if the inequality is $<$ or $>$
5. Pick a point not on the line to use as a test point. The point (0,0) is a good test point if it is not on the line.
6. If the point makes the inequality true, shade that side of the line. If the point does not make the inequality true, shade the opposite side of the line.
7. The area where the shading overlaps is the solution to the system of inequalities.



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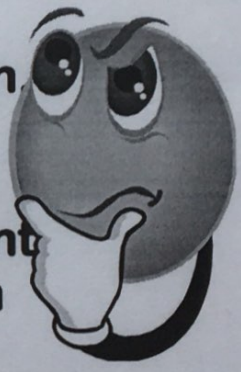


Graphing Systems of Inequalities

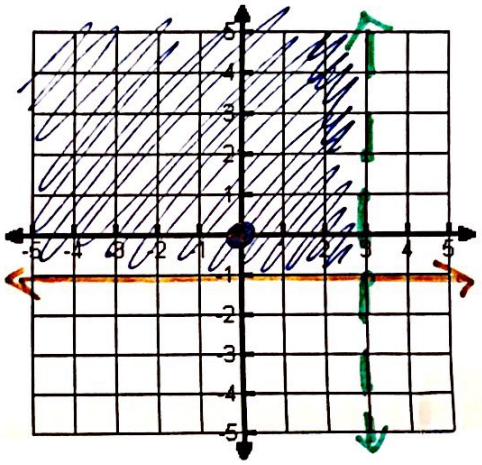
PRACTICE

Ex: $x < 3$
$y \geq -1$

Test Point (0,0)

$0 < 3$
True! Shade Towards

$0 \geq -1$
True! Shade Towards



Ex: $3x - 2y \leq -2$
$x + 4y \geq -12$

$3x - 2y \leq -2$
$-3x \qquad -3x$

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

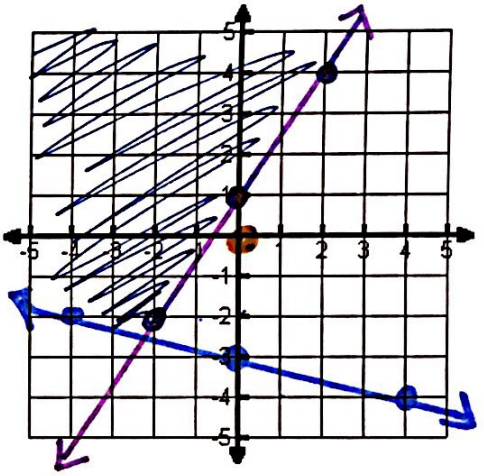
Switch signs when ÷ by negative

$y \geq 1 + \frac{3}{2}x$

$x + 4y \geq -12$

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

$y \geq -3 - \frac{1}{4}x$



Ex: Jonah is going to the store to buy candles. Small candles cost $3.50 and large candles cost $5.00. He needs to buy at least 20 candles, and he cannot spend more than $80. Write and solve a system of linear inequalities that represent the situation.

x = small candles
y = large candles

$$\begin{cases} x + y \geq 20 \\ 3.50x + 5y \leq 80 \end{cases}$$