

Algebra II

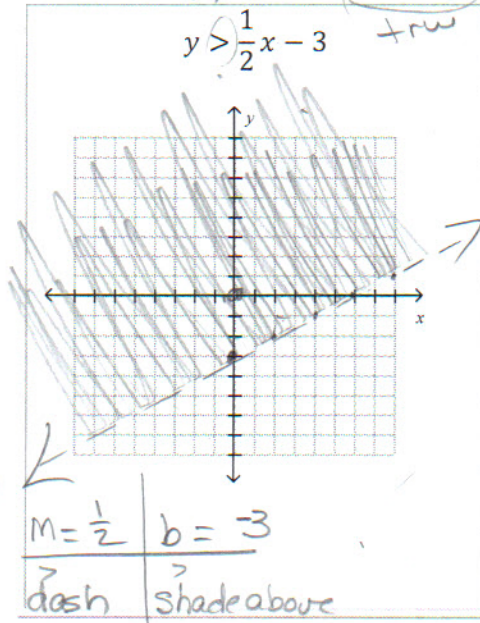
Lesson 2-7: Two-Variable Inequalities

Mrs. Snow, Instructor

You and your family attend your brother's championship baseball game. Between innings you decide to go to the snack bar. You have \$15 and find that sodas are \$2.50 and popcorn is \$1.75. Write and graph an inequality that models the numbers of sodas and bags of popcorn that can be bought. OK, first the last thing you want to do is to get up to place your order only to find that you don't have enough money. The line of 45 people behind you will not appreciate you asking the clerk questions like, well how much will 5 sodas and 3 popcorns cost? You will be wise to step aside and pull out your calculator and pencil and figure this out. Well, that is weird, but a sure way to know exactly how many of what you can buy! Let's figure this out. But, first let's make sure we understand how to graph a basic linear inequality.

Graph

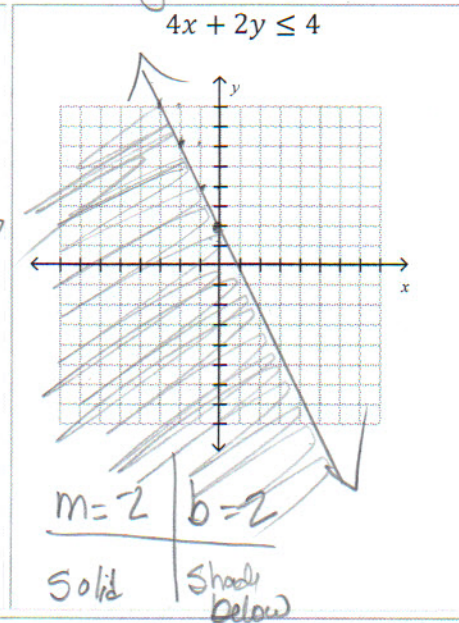
$$y > \frac{1}{2}x - 3 \quad \text{+rw}$$



$$\frac{1}{2}(2y) \leq (-4x + 4) \cdot \frac{1}{2}$$

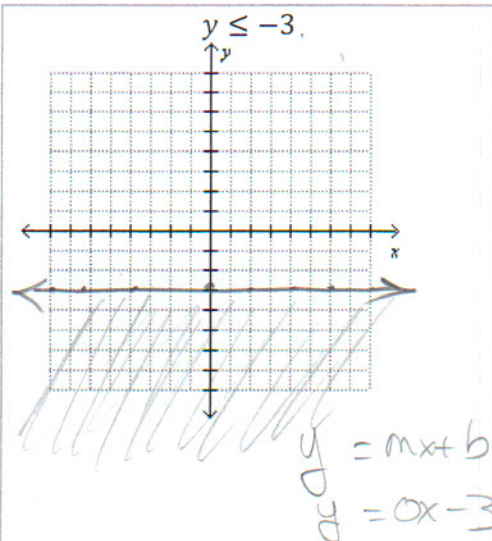
$$y \leq -2x + 2$$

$$4x + 2y \leq 4$$



Negative $\times \div$ Flip inequ!!

$$y \leq -3$$



Going back to our introduction let's identify the facts.

1. The total cost must be $\leq \$15$
2. let the number of sodas = y and number popcorns = x
3. Our equation then becomes: $1.75x + 2.50y \leq 15$
4. Solve for y and graph. Be careful with the coefficients. Isolate y then clear out its coefficient.

Solve:

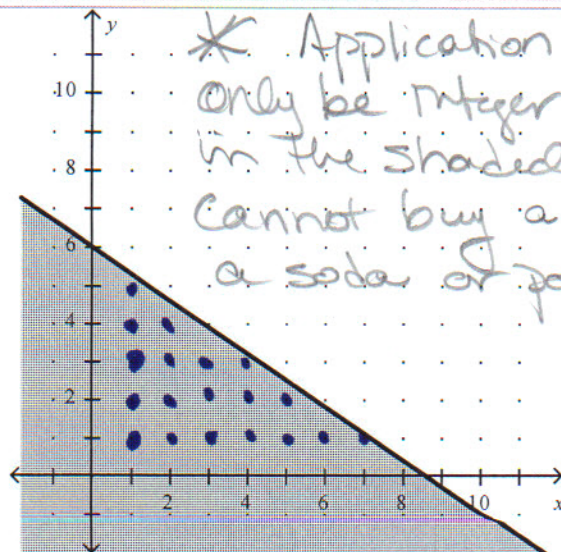
$$1.75x + 2.50y \leq 15$$

$$2.50y \leq 15 - 1.75x$$

$$\left(\frac{1}{2.50}\right) 2.50y \leq (15 - 1.75x) \left(\frac{1}{2.50}\right)$$

$$y \leq -0.7x + 6$$

1. Graph using the slope and y-intercept.
2. Label the axes: popcorn= x and soda= y
3. Is the line solid or dashed?
4. Do we shade above or below the line?
5. In this application are we looking at all of the shaded area as solutions or discrete values?



* Application!! May only be integer values in the shaded area. Cannot buy a part of a soda or popcorn.