Warm Up

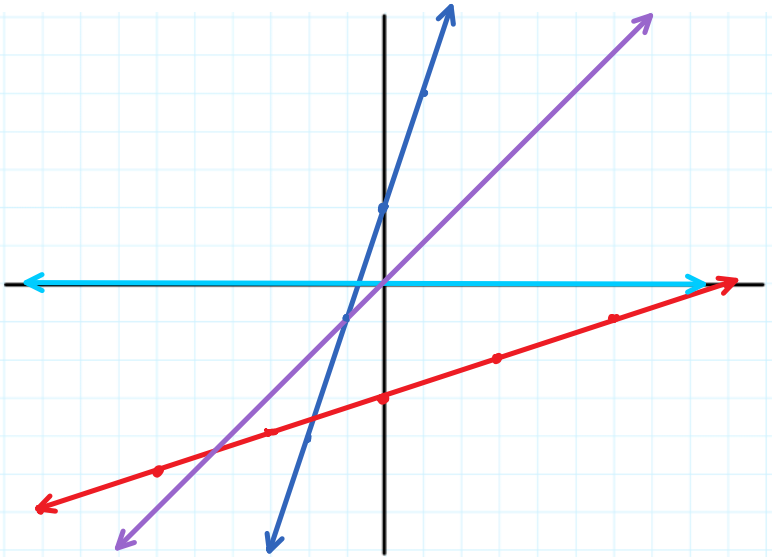
Graph the following lines

$y = 3x + 2$

$y = \frac{1}{3}x - 3$

$y = 0$

$y = x$



Essential Question

How does the graph of a linear inequality in two variables help you identify the solutions of the inequality?

Needed Vocab:

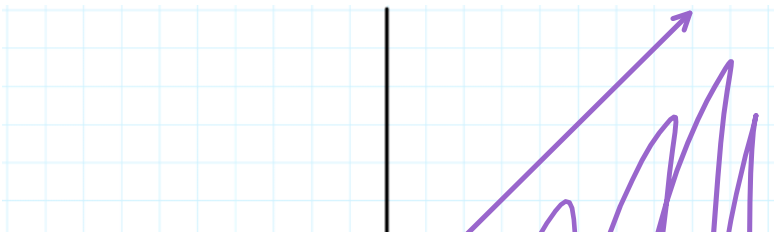
- **Linear inequality in two variables**
- **Solution of a linear inequality in two variables**

Goal: "I can. . .

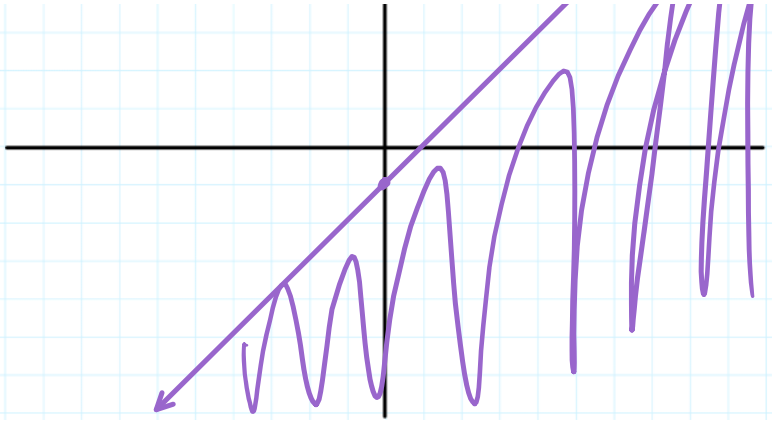
Graph solution to linear inequalities in two variables."

Example 1

What is/are the possible solutions to $y \leq x - 1$?



- Draw the line as if it was $y=mx+b$.
- shade above

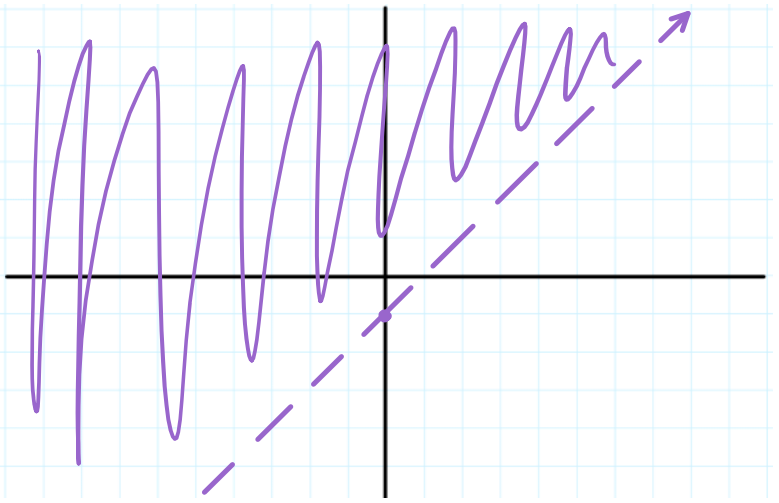


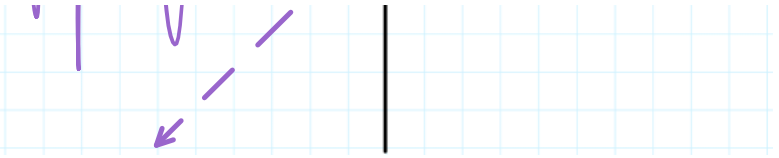
y=mx+b.
- shade above for > or ≥
- shade below for < or ≤
- If it's just < or > make the line dotted.

A linear inequality in two variables looks like an equation in the form of y=mx+b but instead has one of the four inequality symbols. The solution of a linear inequality in two variables is all ordered pairs (x, y) that make the inequality true.

What are the solutions of the inequality $y > x - 1$?

y> shade above
↑
not equal to so dotted.

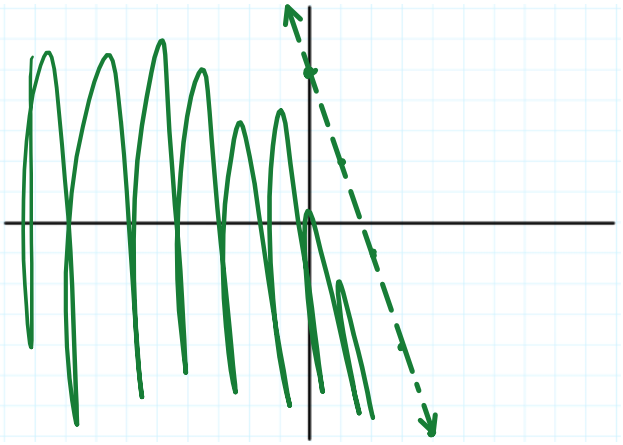




Graph the solutions to the following inequalities.

dotted, below

$y < -3x + 5$



solid, above

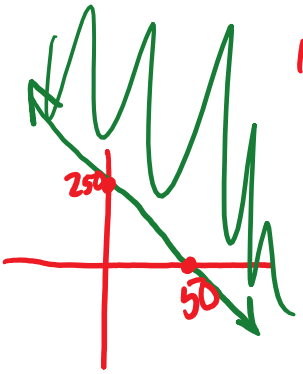
$y \geq -3x + 5$

Example 2

The Science Club sells T-shirts and key chains to raise money. How many T-shirts and key chains could they sell to meet or exceed their goal?

x: T-shirts

y: keychains



$10x + 2y \geq 500$

$2y \geq 500 - 10x$

$y \geq -5x + 250$

any point on or above that line.

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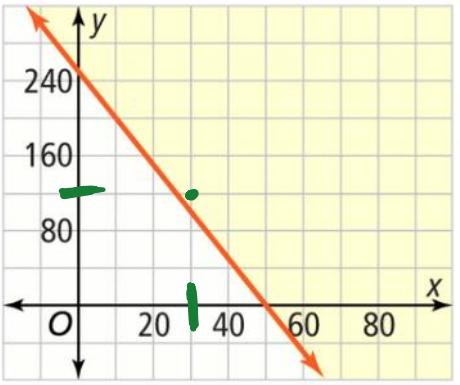
2. Will the Science Club meet their goal if they sell 30 T-shirts and 90 key chains? Explain in terms of the graph of the inequality.

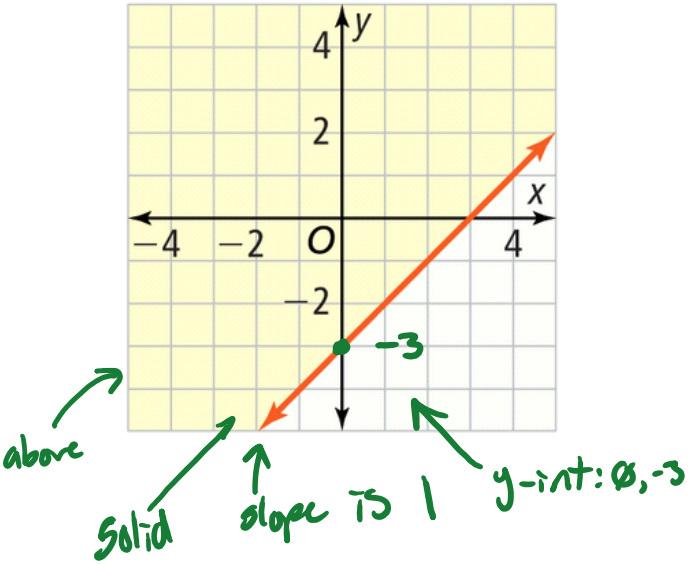
yes



Example 3

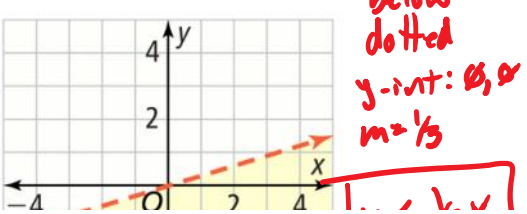
Write the inequality shown in the graph.

$y \geq x - 3$



Write the inequality shown in the graphs.

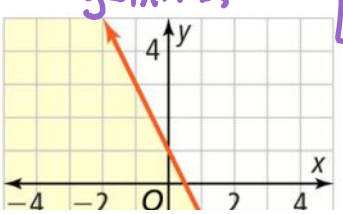
a.

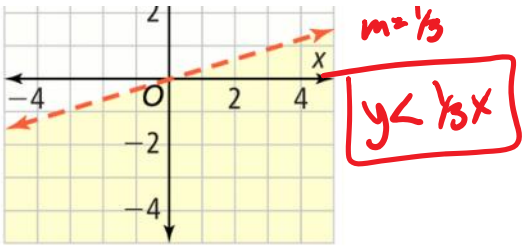


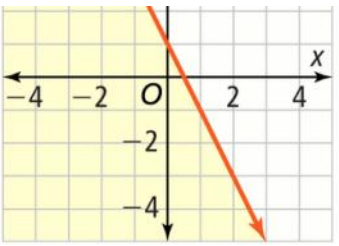
b.

- below
- solid
- y-int: 0, 1
- m = -2

$y \leq -2x + 1$

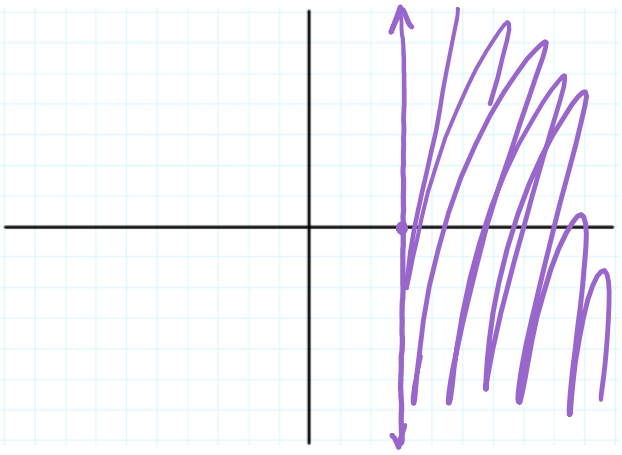




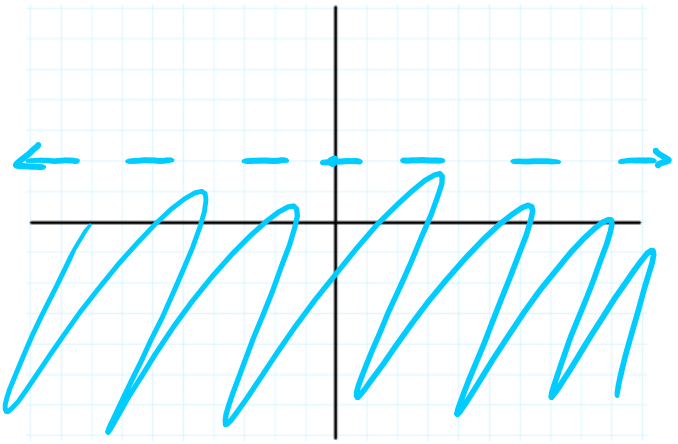


Example 4 What is the graph of the following inequalities?

A. $x \geq 3$

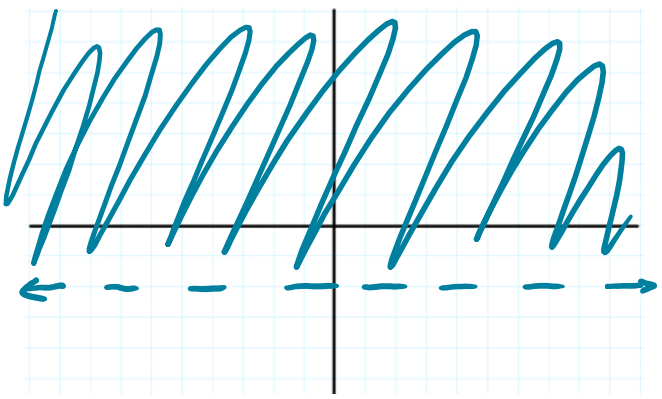


B. $y < 2$

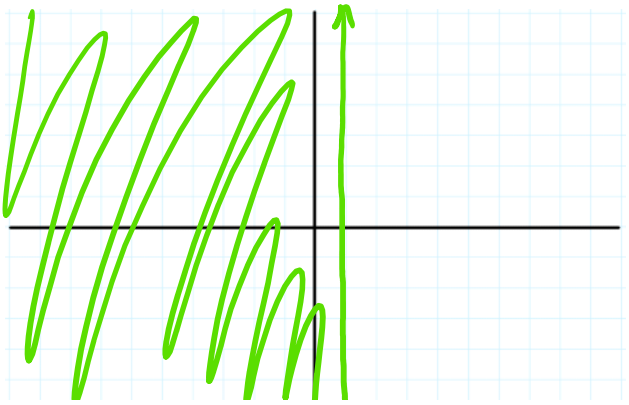


Graph the following inequalities.

A. $y > -2$



B. $x \leq 1$



Homework

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