Linear Inequalities

Recall:

Open circle = NOT equal to

Closed circle = equal to

Now in two variables

Instead of an open circle, we have an open line (dashed).

Instead of a closed circle, we have a closed line (solid).

In two variables we shade w/ respect to y.

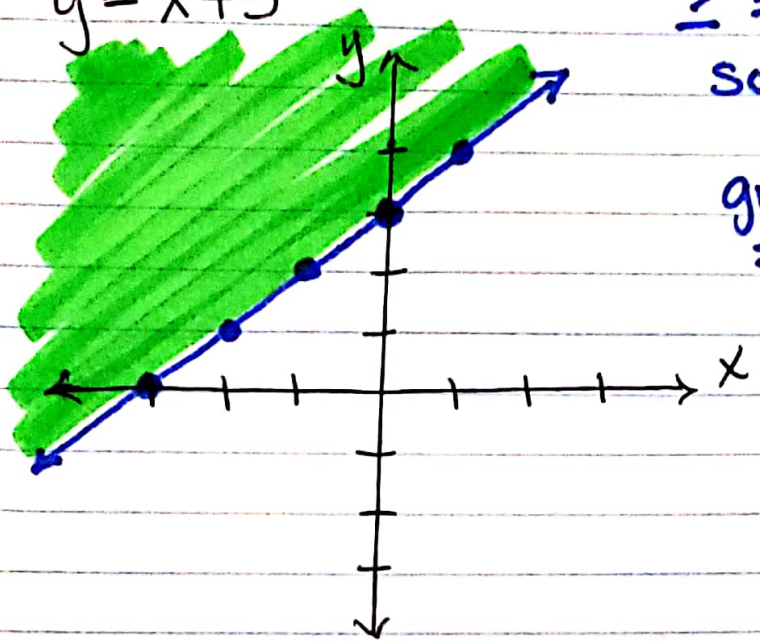
y-axis = vertical = ↕

For $>$ and $\geq$ we shade up (above the line)

For $<$ and $\leq$ we shade down (below the line)

Slope: m=1 ← y-int

Ex: $y \geq x+3$

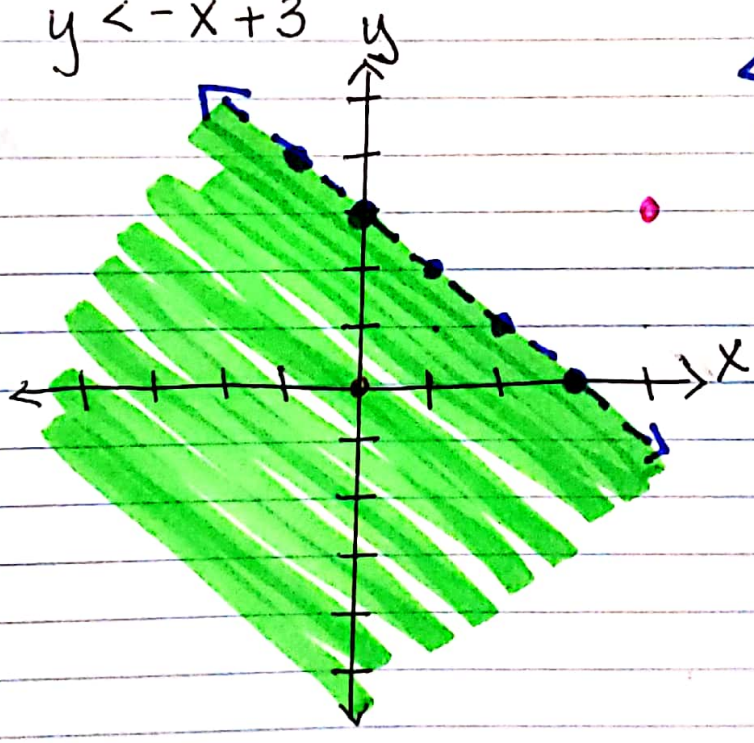


≥ = equal to
solid line

greater than y
shade up

Slope: m=-1 ← y-int

Ex: $y < -x+3$



< = NOT equal
dashed line

less than y
shade
down

Is (0,0) part of the solution? Yes

Is (4,3) part of the solution? NO

Is (0,3) part of the solution? NO

Name: _____ Date: _____ Period: 4th

Writing, Solving, and Graphing Linear Inequalities

Write an inequality based on each given scenario. **Solve** the inequality. **Graph** the inequality.

1. You receive an $80 gift card to the bookstore. Hardback books cost $8 and paperback books cost $4. How many books of each type can you buy?

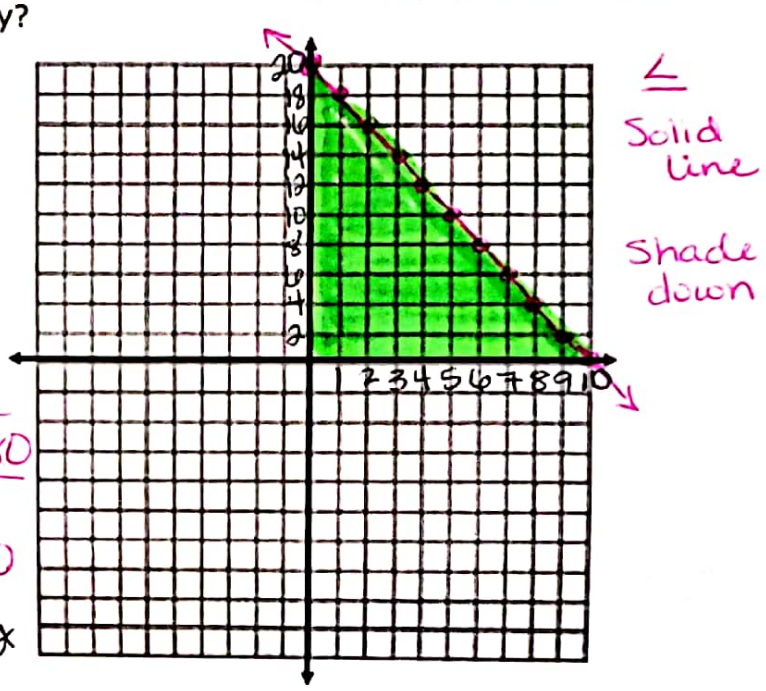
Inequality: $8x + 4y \leq 80$

Solution: $y \leq -2x + 20$

Hardback = x
Paperback = y

$8x + 4y \leq 80$
$-8x \quad -8x$
$\frac{4y}{4} \leq \frac{-8x + 80}{4}$
$y \leq -2x + 20$

slope $m = -2$; y-int



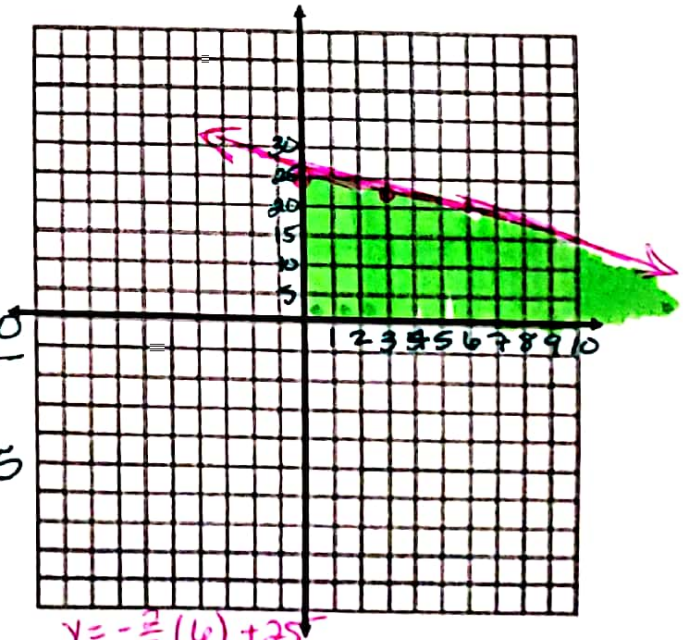
2. A catering company has small tables and large tables. Small tables seat 4 people and large tables seat 6. They are planning a party for ~~100~~ 150 guests. How many of each size table can they use?

Inequality: $4x + 6y \leq 150$

Solution: _____

small - x
large - y

$4x + 6y \leq 150$
$-4x \quad -4x$
$\frac{6y}{6} \leq \frac{-4x + 150}{6}$
$y \leq -\frac{2}{3}x + 25$



$y = -\frac{2}{3}(3) + 25$
$y = -2 + 25$
$y = 23$

$y = -\frac{2}{3}(6) + 25$
$y = -4 + 25$
$y = 21$