

§6-1 Graphing Linear Inequalities in Two Variables

Let x be the kg of nuts \$25/kg nuts
 Let y be the kg of raisins \$8/kg raisins.
total less than \$200

$$25x + 8y < 200$$

What are 3 different combinations of nuts and raisins that would cost less than \$200?

- (x, y) $(7, 3)$ $(4, 12)$ $(1, 1)$
 $(1, 1)$
 $(1, 2)$ ← a few combinations that would work.
 $(3, 3)$

continuous
 $x \geq 0$
 $y \geq 0$ } Real numbers

Example 1 (p295)

Graph the solution set for this linear inequality:

$$-2x + 5y \geq 10$$

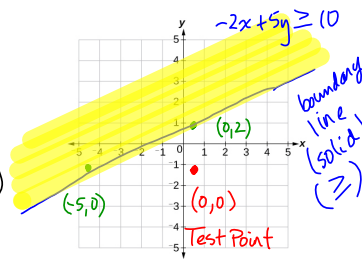
Graph the boundary line (the equation $-2x + 5y = 10$)

x-intercept (let $y=0$)

$$\begin{aligned} -2x + 5(0) &= 10 \\ -2x &= 10 \\ \boxed{x = -5} \end{aligned}$$

y-intercept (let $x=0$)

$$\begin{aligned} -2(0) + 5y &= 10 \\ 5y &= 10 \\ \boxed{y = 2} \end{aligned}$$



Test $(0,0)$ in the inequality:

<u>LS</u>	<u>RS</u>
$-2x + 5y$	10
$-2(0) + 5(0)$	
0	

Since 0 is not ≥ 10 , the point $(0,0)$ is not in the solution set. (Shade the other side of the line)

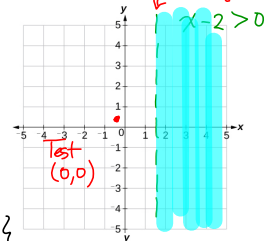
Assume we are working with real numbers since no context is given for the inequality.

Example 2 - Graphing linear inequalities with vertical or horizontal boundary lines.

a) $\{(x,y) \mid x-2 > 0, x \in \mathbb{R}, y \in \mathbb{R}\}$

↑ point ↑ such that ↑ domain element of real numbers ↑ range element of real numbers

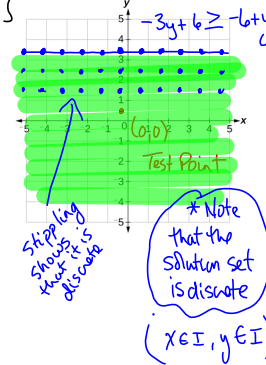
$x-2 > 0$
 $x > 2$
 (boundary line is $x=2$)



b) $\{(x,y) \mid -3y+6 \geq -6+y, x \in \mathbb{I}, y \in \mathbb{I}\}$

Graph the boundary line
 $-3y+6 \geq -6+y$
 $-4y \geq -12$
 $y \leq 3$

← boundary $y=3$
 ↑ direction changes (division by neg #)



Example 3

\$100 / skis
 \$120 / snowboard
 goal to meet or exceed \$600 per day.

let x be # of pairs of skis sold
 let y be # of snowboards

$100x + 120y \geq 600$

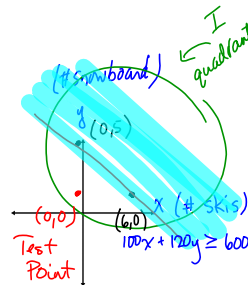
Graph boundary line $100x + 120y = 600$

x-intercept (let $y=0$)

$100x + 120(0) = 600$
 $100x = 600$
 $x = 6$

y-intercept (let $x=0$)

$100(0) + 120y = 600$
 $y = 5$



$\{(x,y) \mid 100x + 120y \geq 600, x \in \mathbb{W}, y \in \mathbb{W}\}$

- * p302 - Summary (look over)
- * p303 - CYU (look over)
- * p303 - practising (4, 5, 7, 8)