4.6 G

① $3x + y \leq 1$

$x - y \leq 3$

$3x + y \leq 1$

$-3x \quad -3x$

$y \leq -3x + 1$

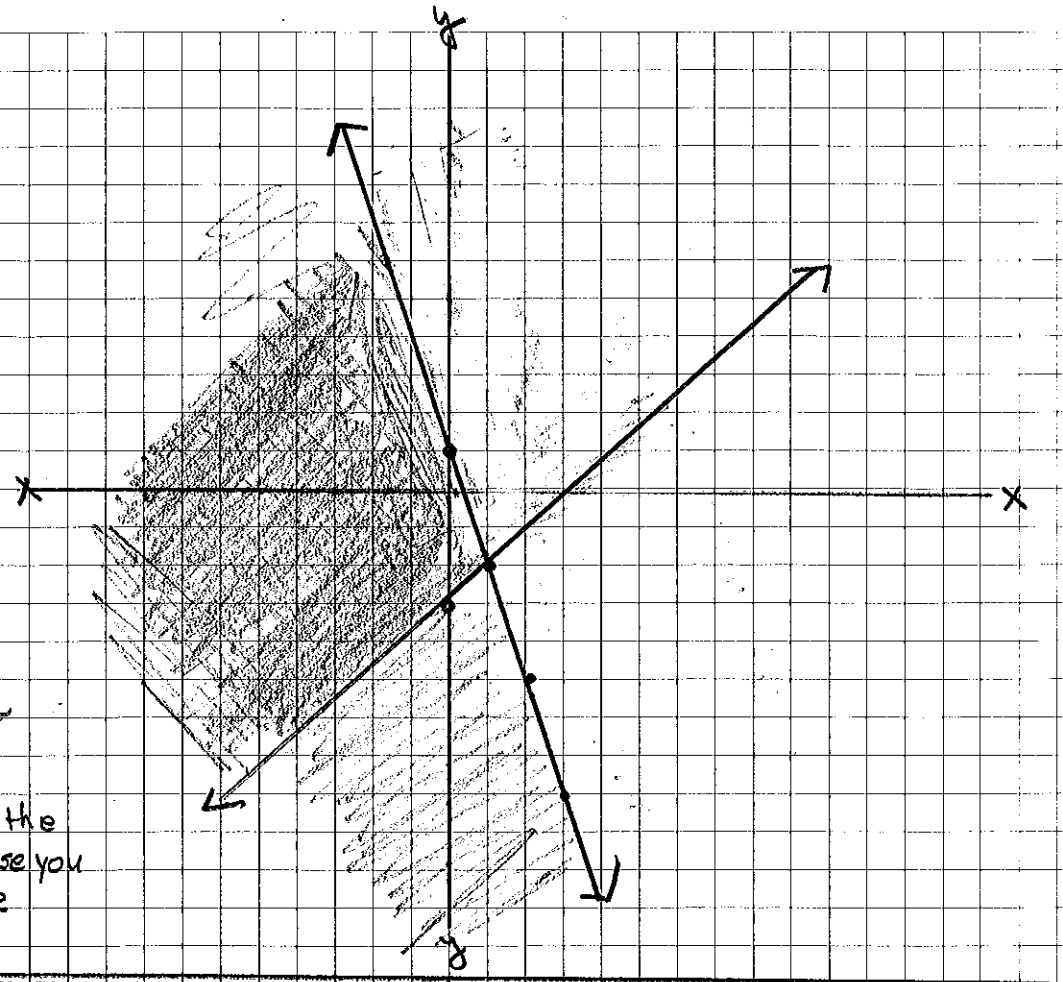
$x - y \leq 3$

$-x \quad -x$

$\frac{-y}{-1} \leq \frac{-x}{-1} + \frac{3}{-1}$

$y \geq x - 3$

Change the direction of the inequality sign because you divided by a negative



② $5x - y \leq 1$

$x + 3y \leq -2$

$5x - y \leq 1$

$-5x \quad -5x$

$\frac{-y}{-1} \leq \frac{-5x}{-1} + \frac{1}{-1}$

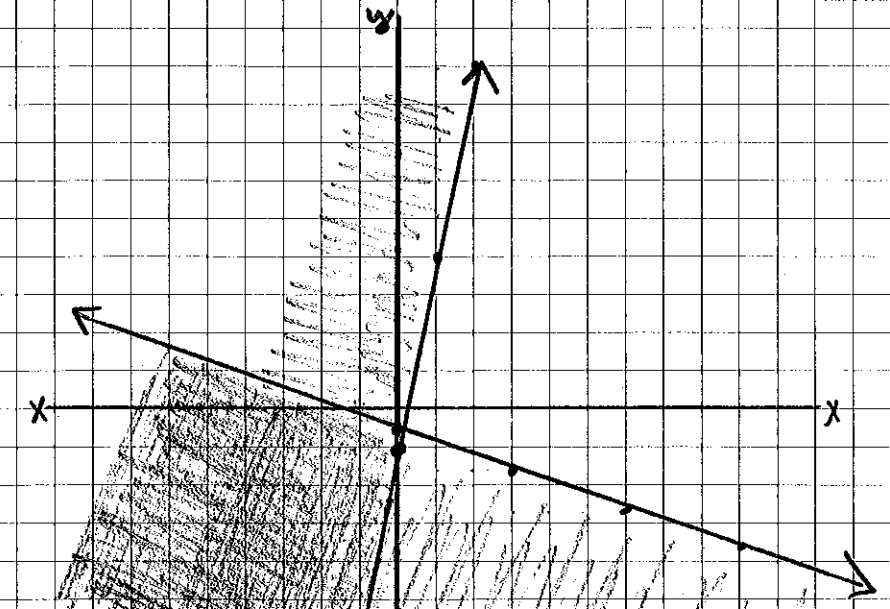
$y \geq 5x - 1$

Change direction of inequality

$x + 3y \leq -2$

$-x \quad -x$

$3y \leq -x - 2$



4.6 6

(11) x = banana bread

y = nut bread

She wants to make at most 10 loaves.

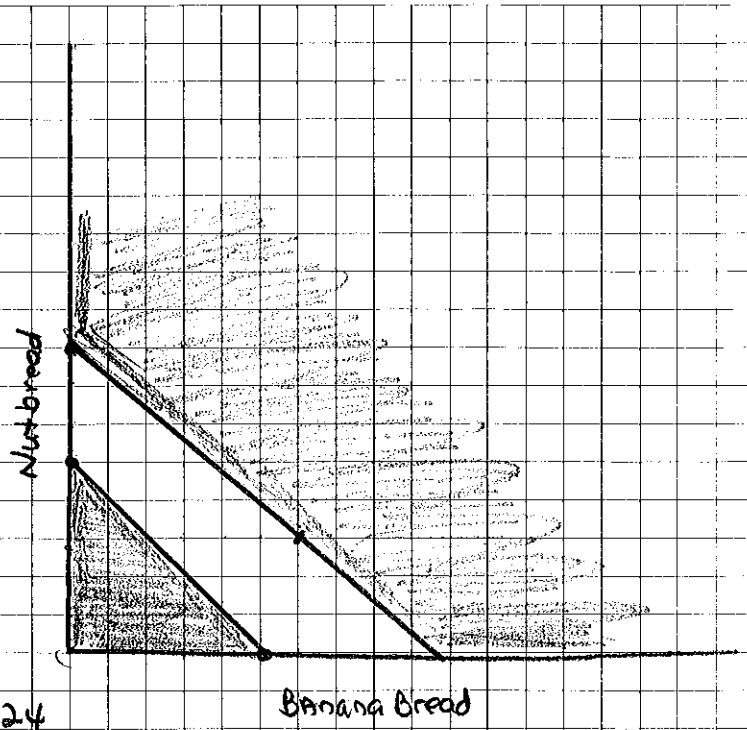
$x + y \leq 10$

Banana bread sells for \$1.25 : $1.25x$

Nut bread sells for \$1.50 : $1.5x$

She wants to make at least \$24

$1.25x + 1.5y \geq 24$



$x + y \leq 10$

$-x \quad -x$

$y \leq -x + 10$

$1.25x + 1.5y \geq 24$

$-1.25x \quad -1.25x$

$\frac{1.5y}{1.5} \geq \frac{-1.25x}{1.5} + \frac{24}{1.5}$

$y \geq -\frac{5}{6}x + 16$

Interpretation:

Since the graphs do not overlap, it means that it is an impossible situation. She cannot sell any combination of 10 loaves and make \$24.

(12) y : always start with y

$<$: because it is shaded below the line

Not "or equal to" because line is dashed

$-\frac{1}{3}x$: slope $m = \frac{y_2 - y_1}{x_2 - x_1}$ $(-4,1)$ $(2,-1)$ $\frac{1--1}{-4-2} = \frac{2}{-6} = -\frac{1}{3}$

$-\frac{1}{3}$: intercepts y-axis at a little after zero in negative area

$$y < -\frac{1}{3}x - \frac{1}{3} \text{ (estimated)}$$

(1) y : always start with y

$>$: because it is shaded above the dashed line

$-\frac{5}{7}x$: slope $= \frac{2--3}{-4-3} = -\frac{5}{7}$ $(-4,2)$ $(3,-3)$

$-\frac{3}{4}$: intercepts y-axis at almost -1

$$y > -\frac{5}{7}x - \frac{3}{4} \text{ (estimated)}$$

(13) $5x + 7y > -6$

$-5x \quad -5x$

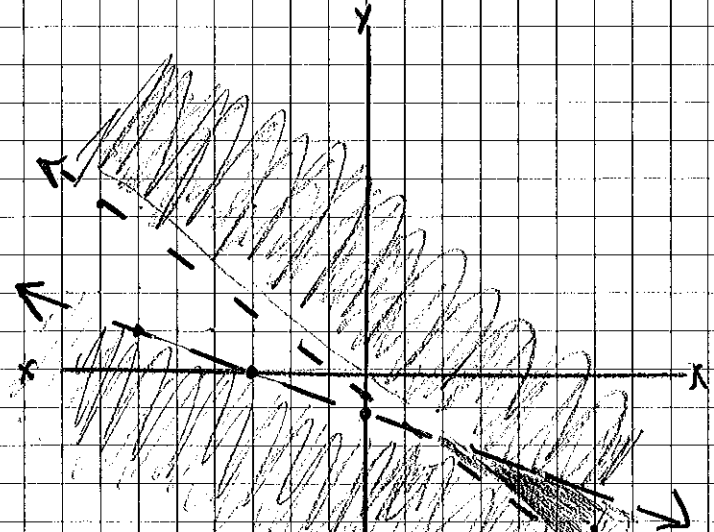
$\frac{7y}{7} > \frac{-5x}{7} - \frac{6}{7}$

$y > -\frac{5}{7}x - \frac{6}{7}$

$x + 3y < -3$

$-x \quad -x$

$3y < -x - 3$



4.6 G

(14) $x + 4y - 2 \geq 0$

$-x \quad +2 \quad +2 \quad -x$

$\frac{4y}{4} \geq \frac{-x+2}{4}$

$y \geq -\frac{1}{4}x + \frac{1}{2}$

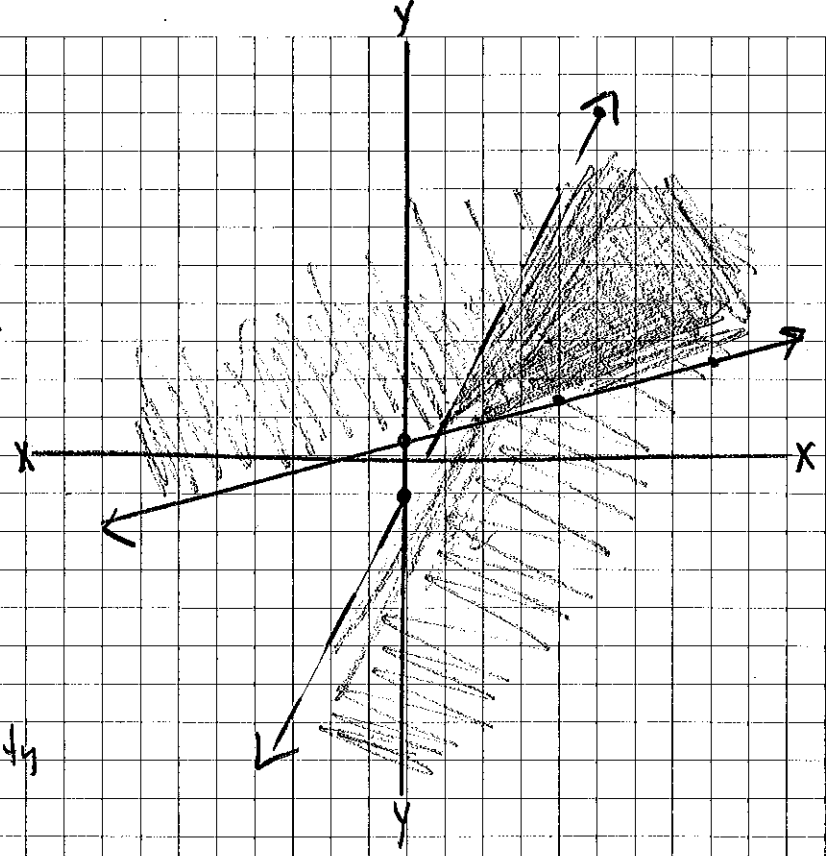
$2x - y + 1 > 2$

$-2x \quad -1 \quad -2x - 1$

$\frac{-y}{-1} > \frac{-2x+1}{-1}$

$y < 2x - 1$

Change direction of inequality



(15) $\frac{x}{2} - 5 > -6y$

$3x + y > 2$

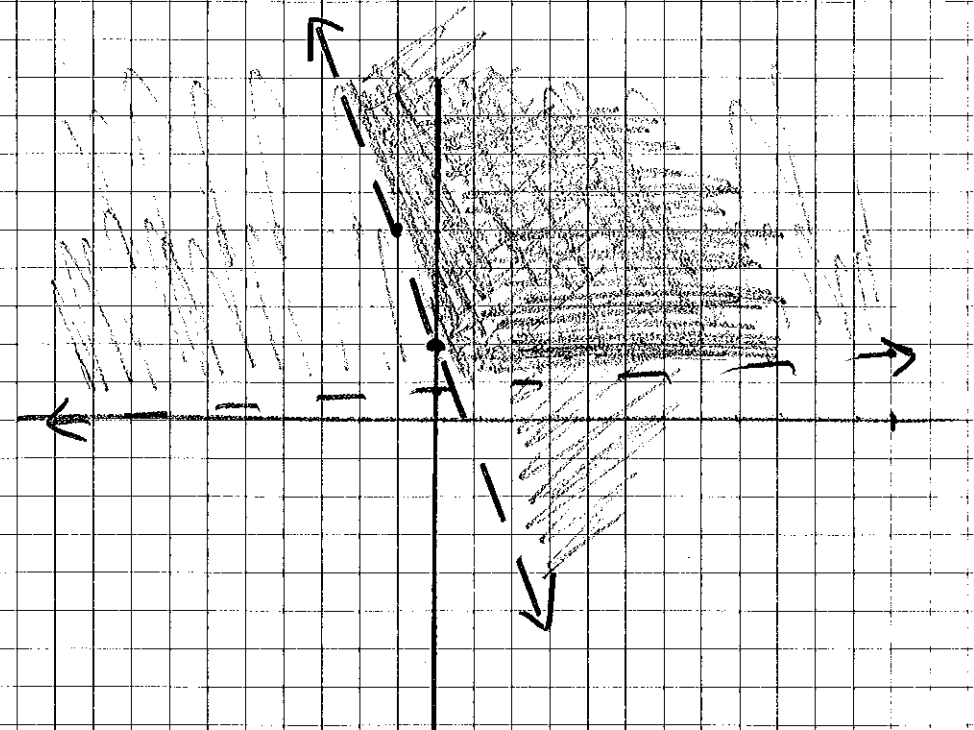
$\frac{x}{2} - 5 > -6y$

$\frac{x}{12} + \frac{5}{6} < y$

$3x + y > 2$

$-3x \quad -3x$

$y > -3x + 2$



⑦ (0,1)

$1 - x \geq 3y$

$1 - 0 \geq 3(1)$

$1 \geq 3$

This statement is not true, so the ordered pair is not a solution.

No

⑧ (-2,3)

$2x + 3y > 2$

$2(-2) + 3(3) > 2$

$-4 + 9 > 2$

$5 > 2$

TRUE, NOW CHECK OTHER INEQUALITY

$3x + 5y > 1$

$3(-2) + 5(3) > 1$

$-6 + 15 > 1$

$9 > 1$

TRUE. BOTH INEQUALITIES ARE TRUE, SO ORDERED PAIR IS A SOLUTION

YES

⑨ (1,4)

$2x + y > 3$

$2(1) + 4 > 3$

$2 + 4 > 3$

$6 > 3$

TRUE, CHECK OTHER EQUATION

$-3x - y \leq 5$

$-3(1) - 4 \leq 5$

$-3 - 4 \leq 5$

$-7 \leq 5$

TRUE.

YES

⑩ He can work 20 hours per week dog-walking and car washing.

x = dog washing hours y = car wash hours

$x + y \leq 20$

He needs to earn at least $75

He gets $5 per hour dog walking: $5x$

He gets $4 per hour car washing: $4y$

$5x + 4y \geq 75$

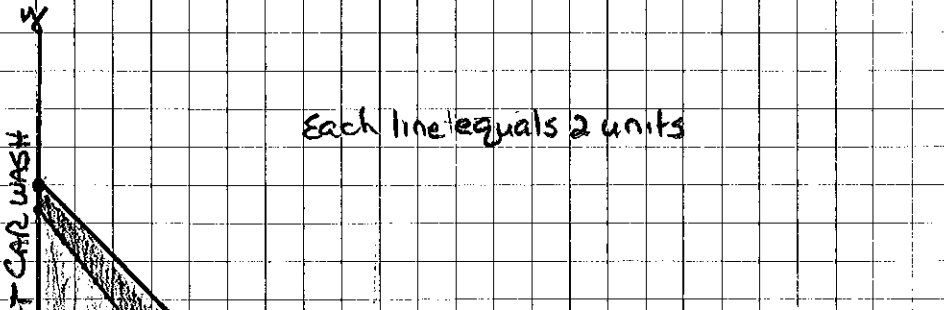
$x + y \leq 20$

$-x \quad -x$

$y \leq -x + 20$

$5x + 4y \geq 75$

$-5x \quad -5x$



4.6G

③ $4x+3y \leq 1$

$2x-y \leq 2$

$4x+3y \leq 1$

$-4x \quad -4x$

$\frac{3y}{3} \leq \frac{-4x+1}{3}$

$y \leq -\frac{4}{3}x + \frac{1}{3}$

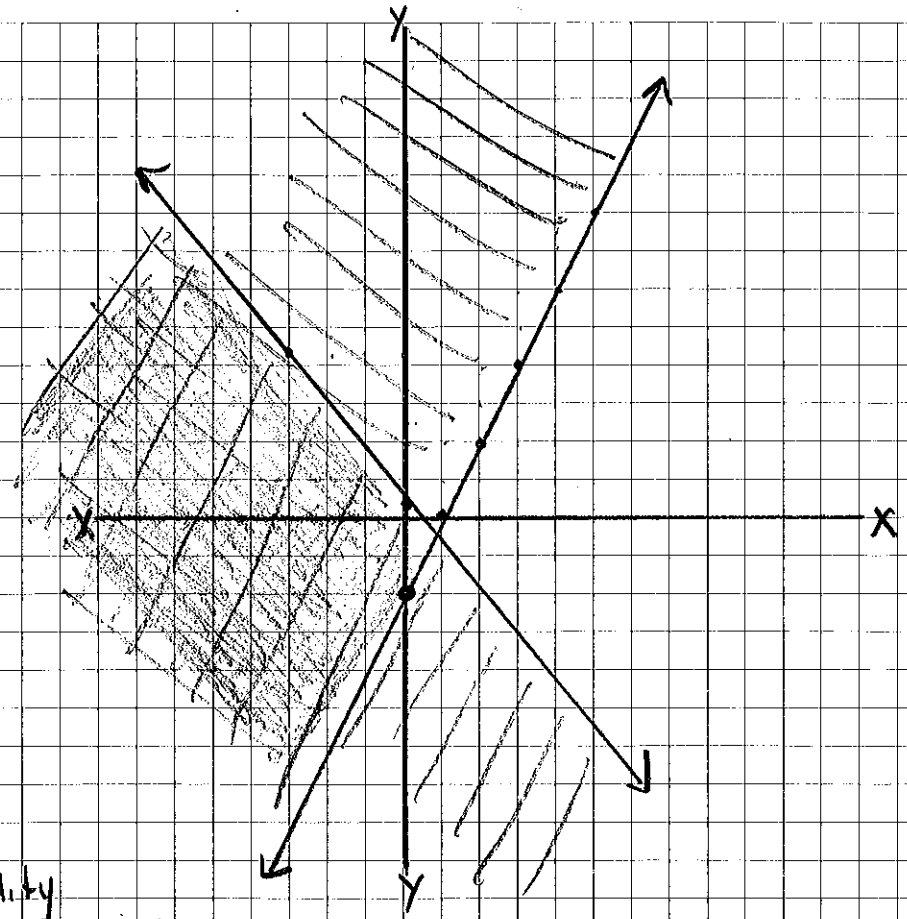
$2x-y \leq 2$

$-2x \quad -2x$

$\frac{-y}{-1} \leq \frac{-2x+2}{-1}$

$y \geq 2x-2$

change direction of inequality



⑥ $x-y \geq 3$

$y < -2$

$x \geq 1$

$x-y \geq 3$

$-x \quad -x$

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

$y \leq x-3$

change direction of inequality