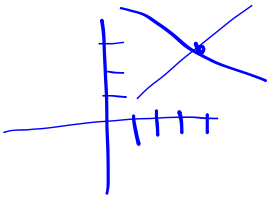
a. $2x - 5y = -7$
$3x + y = 15$

$2x-5y=-7$
$\times 5 \quad 15x+5y=75$
$17x=68$
$x=4$

$2(4)-5y=-7$
$8-5y=-7$
$-5y=-7-8$
$-5y=-15$
$y=3$



$(4,3)$

(b) ① $6x+4y=-10$
② $5x+3y=-9$

$\times 3 \quad 18x+12y=-30$
$\times -4 \quad -20x-12y=36$
① + ② $-2x=6$
$x=-3$

$5(-3)+3y=-9$
$-15+3y=-9$
$3y=-9+15$
$3y=6$
$y=2$

$(-3,2)$

c. $2(x-4)+3(y+1)=-1$
$x-16=8y+5$

$\Rightarrow 2x-8+3y+3=-1$
$2x+3y-5=-1$
① $2x+3y=4$
② $x-8y=21$

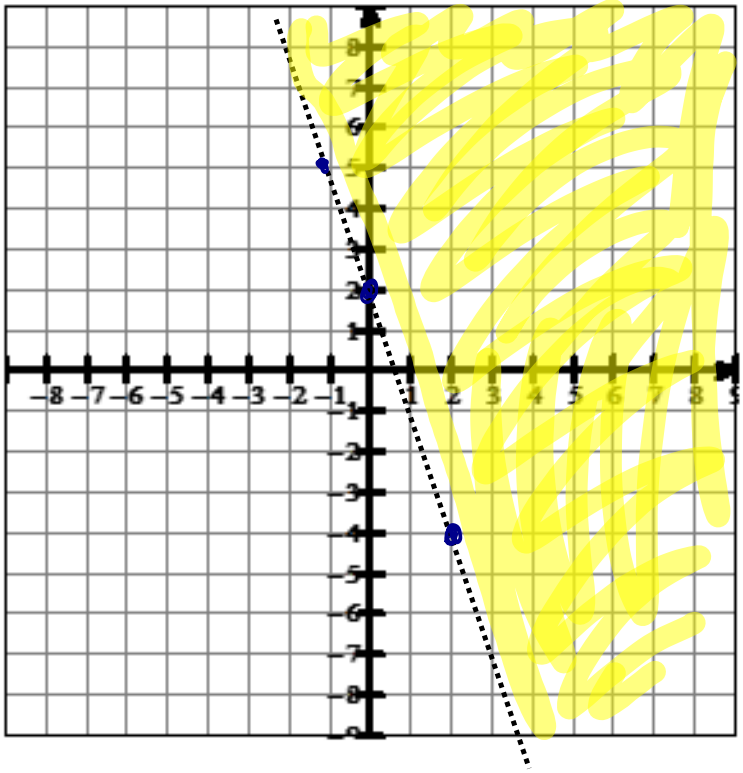
$x-8y=5+16$
$x-8y=21$

① $2x+3y=4$
$\times 2 \quad 2x-16y=42$
① − ② $19y=-38$
$y=-2$

$x-8(-2)=21$
$x+16=21$
$x=21-16$
$x=5$

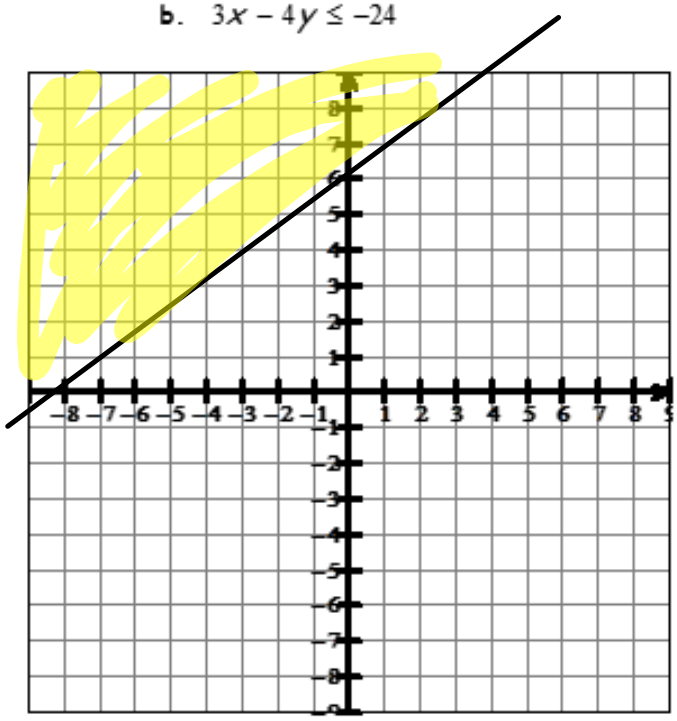
$(5,-2)$

a. $y > -3x + 2$

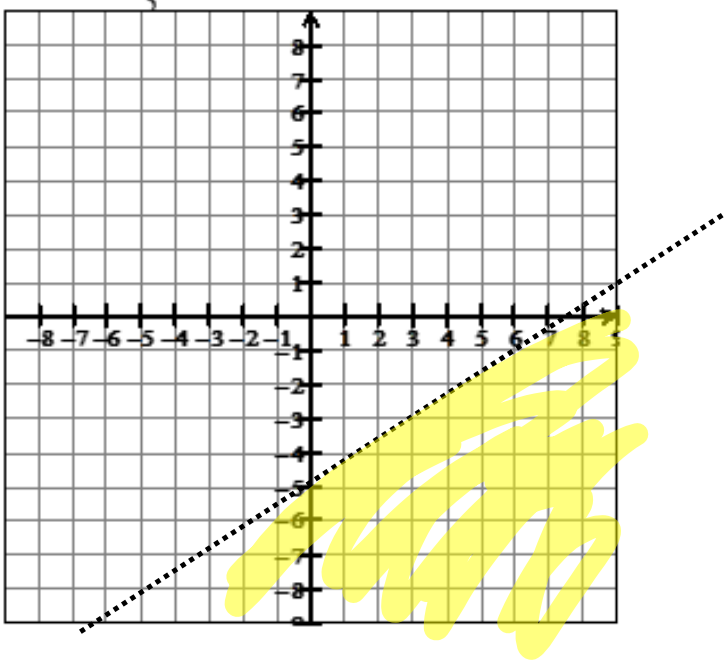


x	y
0	2
-1	5
2	-4

b. $3x - 4y \leq -24$



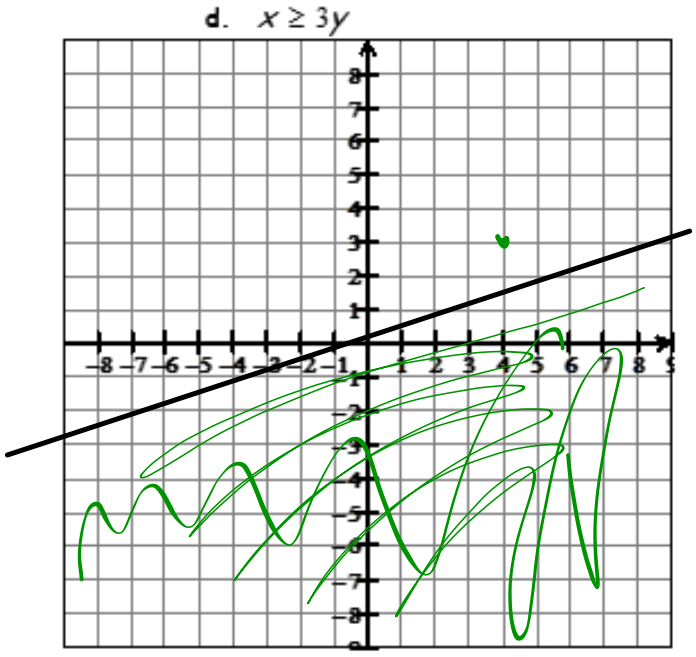
c. $y < \frac{2}{3}x - 5$



$y < \frac{2}{3}x - 5$

x	y
-3	
0	
3	
6	

d. $x \geq 3y$



$3y \leq x$

$y \leq x/3$

x	y
-3	-1
0	0
3	1
6	2

$x \geq 3y$

x	y
3	1
0	0
6	2

$4 \geq 3(3)$

No

3. Given the following constraints, graph each:

a.

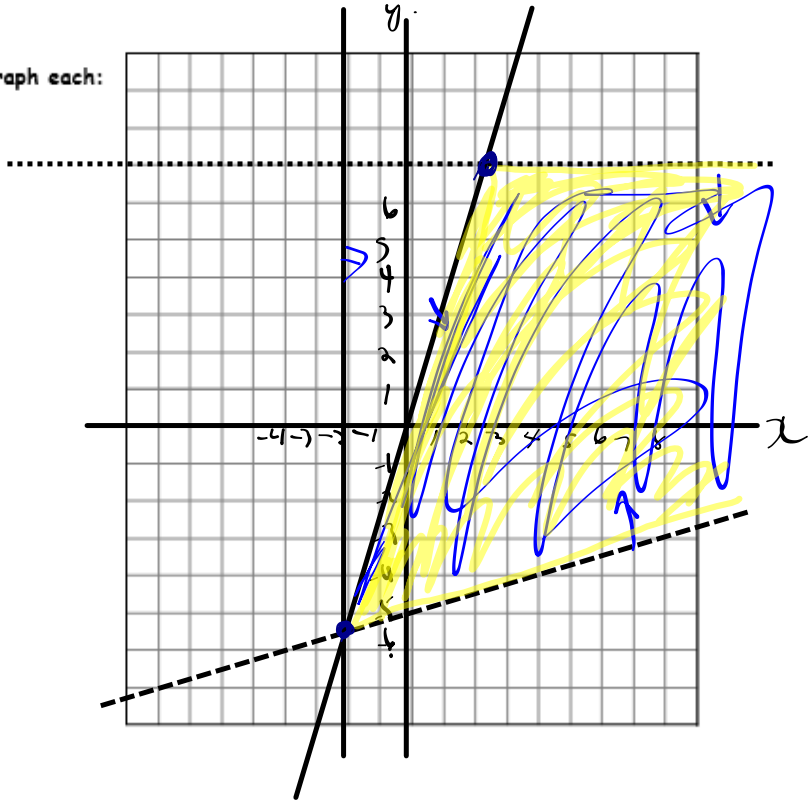
$x \in R$, $y \in R$

$x \geq -2$

$y < 7$

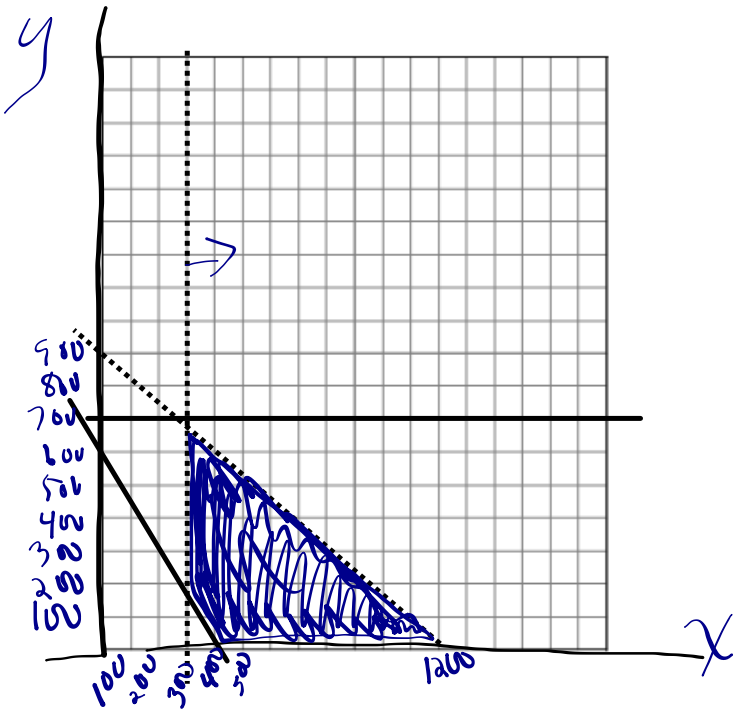
$y \leq 3x$

$y > \frac{1}{4}x - 5$

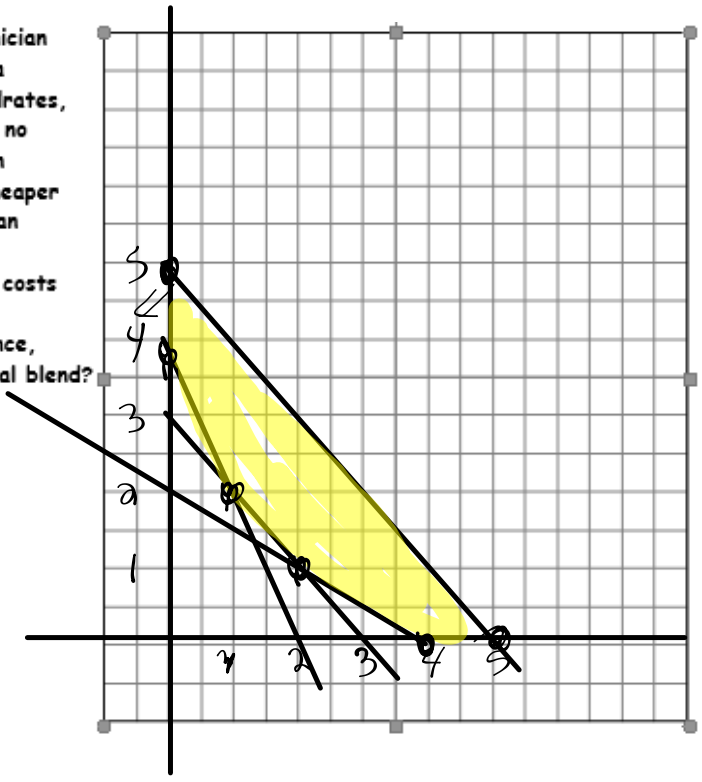


b. $x \geq 0$
$y \geq 0$
$x > 300$
$y \leq 700$
$6x + 4y \geq 2400$
$3x + 4y < 3600$

(400,0)
(0,600)
(1200,0)
(0,900)



4. In order to ensure optimal health, a lab technician needs to feed the rabbits a daily diet containing a minimum of 24 grams (g) of fat, 36 g of carbohydrates, and 4 g of protien. But the rabbits should be fed no more than five ounces of food a day. Rather than order rabbit food that is custom-blended, it is cheaper to order Food X and Food Y, and blend them for an optimal mix. Food X contains 6 g of fat, 12 g of carbohydrates, and 2 g of protein per ounce, and costs $0.20 per ounce. Food Y contains 12 g of fat, 12 g of carbohydrates, and 1 g of protein per ounce, at a cost of $0.30 per ounce. What is the optimal blend?



Constraints

fat: $6x + 12y \geq 24$ (4,0) (0,2)

carbs: $12x + 12y \geq 36$ (3,0) (0,3)

protein: $2x + 1y \geq 4$ (2,0) (0,4)

the maximum weight of the food is five ounces, so: $x + y \leq 5$ (0,5) (5,0)

Optimization

optimization equation will be the cost relation $C = 0.2x + 0.3y$, and we need the minimum value

$C = 0.2x + 0.3y$

(5,0) $C = 1.00$

(4,0) $C = 0.8$

(0,4) $C = 1.2$

(0,5) $C = 1.0$

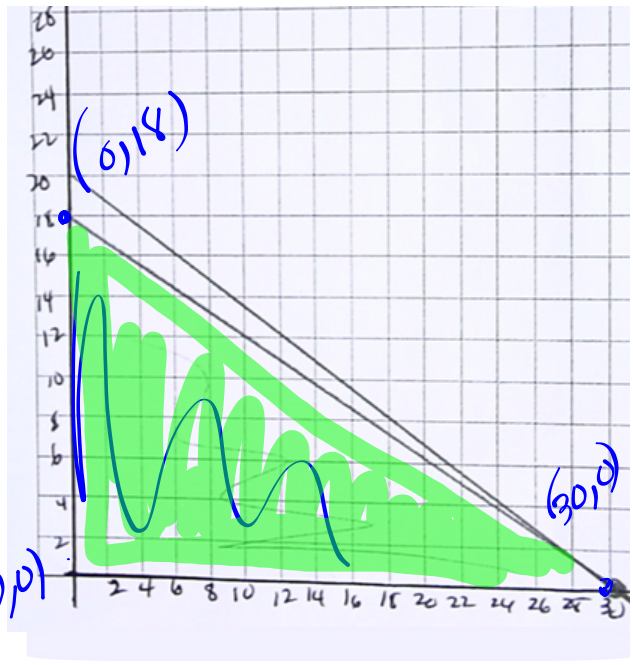
(1,2) $C = 0.8$

(2,1) $C = 0.7$

$x = 2$

$y = 1$

5. A carpenter manufacturer makes two types shelves: Wall mount and Stand alone. Wall Mount require3 hours assembly and 2 hour to finish , Stand Alone requires 5 hours assembly and 3 hour to finish. There are at most 90 hours available for assembly and at most 60 hours available for finishing. The company makes $65 per Wall Mount and $100 per Stand Alone.
How many should they make of each per week to maximize their profits. **(make sure to label your axis)**



x = wall #

y = standalone #

	x	y	
Assm	3	5	≤ 90
Finish	2	3	≤ 60

$3x+5y \leq 90$

$2x+3y \leq 60$

$P = 65x+100y$

$P = 65(0)+100(0) = 0$

$P(0,18) = 1800$

$P(30,0) = 1950$ most profit

6.

You are given a test where computation problems are worth 6 points and word problems are worth 10 points. It takes you 2 minutes to solve a computation problem and 4 minutes to solve a word problem. You have 120 minutes to take the test and you must answer at least 30 questions. There are at least twice as many computation problems as word problems. How many of each problem should you answer to get the most points? (make sure to label your

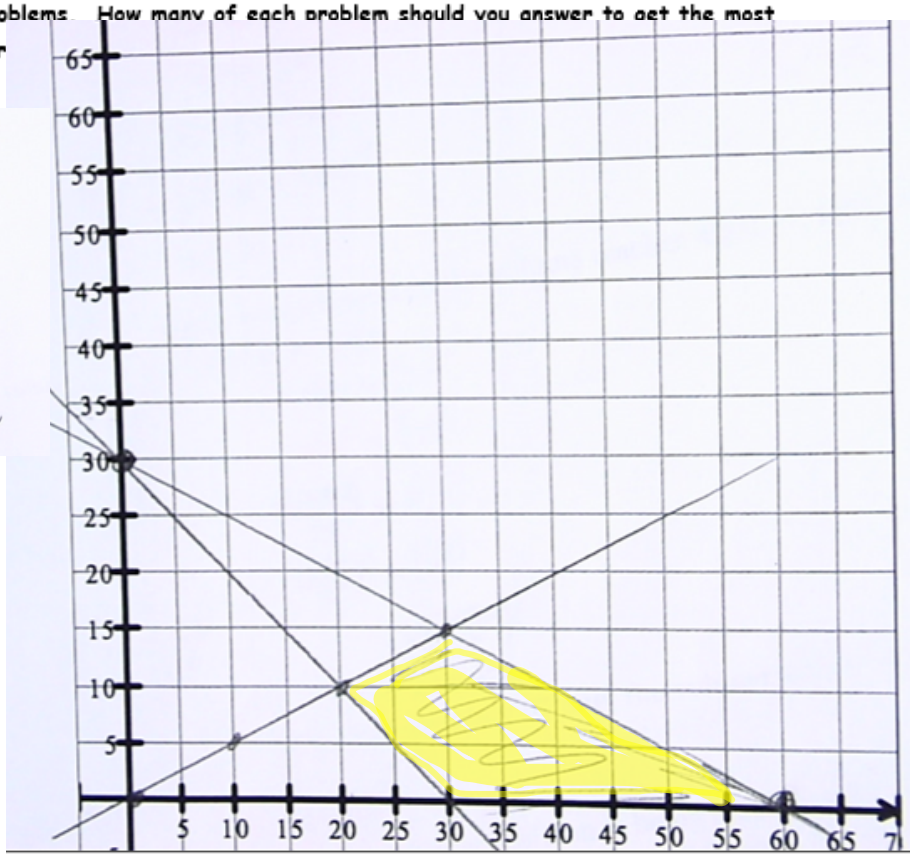
x = # comp
y = # word

$2x + 4y \leq 120$

$x + y \geq 30$

$x \geq 2y \rightarrow 2y \leq x$

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



Points

$6x + 10y$

(30,0) $P = 180$

(60,0) $P = 360$

(20,10) $P = 220$

(30,15) $P = 330$