1 (a) $4x-7y=6$
$2x+y=12$

① $4x-7y=6$
②×7 $14x+7y=84$
① + ② $18x=90$
$x=5$

sub $x=5$
$4(5)-7y=6$
$20-7y=6$
$-7y=-14$
$y=2$

$(5,2)$

(b) ① $6x-5y=-3$
② $5x+3y=19$

①×3 $18x-15y=-9$
②×5 $25x+15y=95$
① + ② $43x=86$
$x=2$

Sub $x=2$
$6(2)-5y=-3$
$12-5y=-3$
$-5y=-15$
$y=3$

$(2,3)$

(c) $3(x+4)-4(y+1)=7$
$3x+12-4y-4=7$
$3x-4y+8=7$
$3x-4y=-1$

$x-9=y$
$x-y=9$

① $3x-4y=-1$
② $x-y=9$

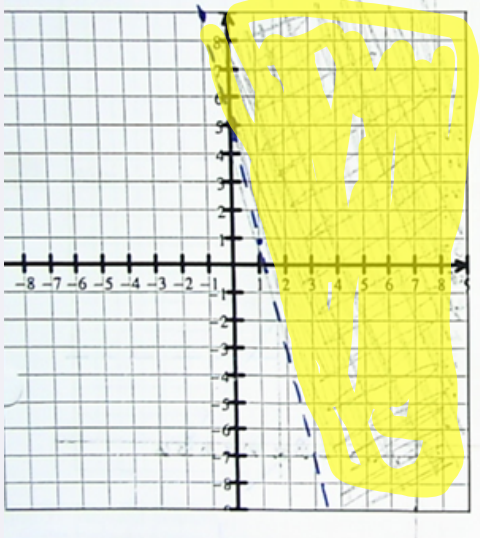
①
②×3 $3x-3y=27$
① − ② $-y=-28$
$y=28$

sub $y=28$ $x-28=9$
$x=37$

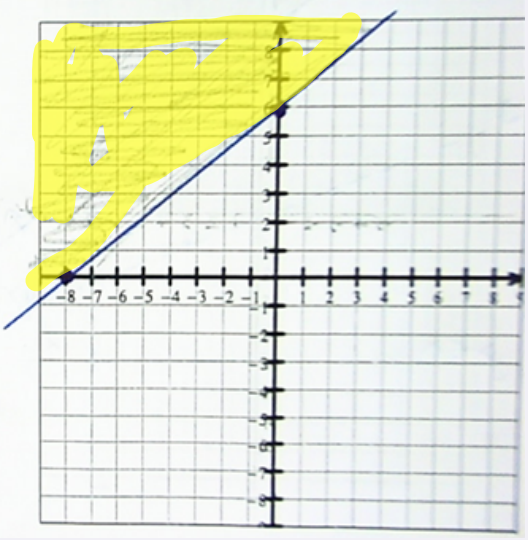
$(37,28)$

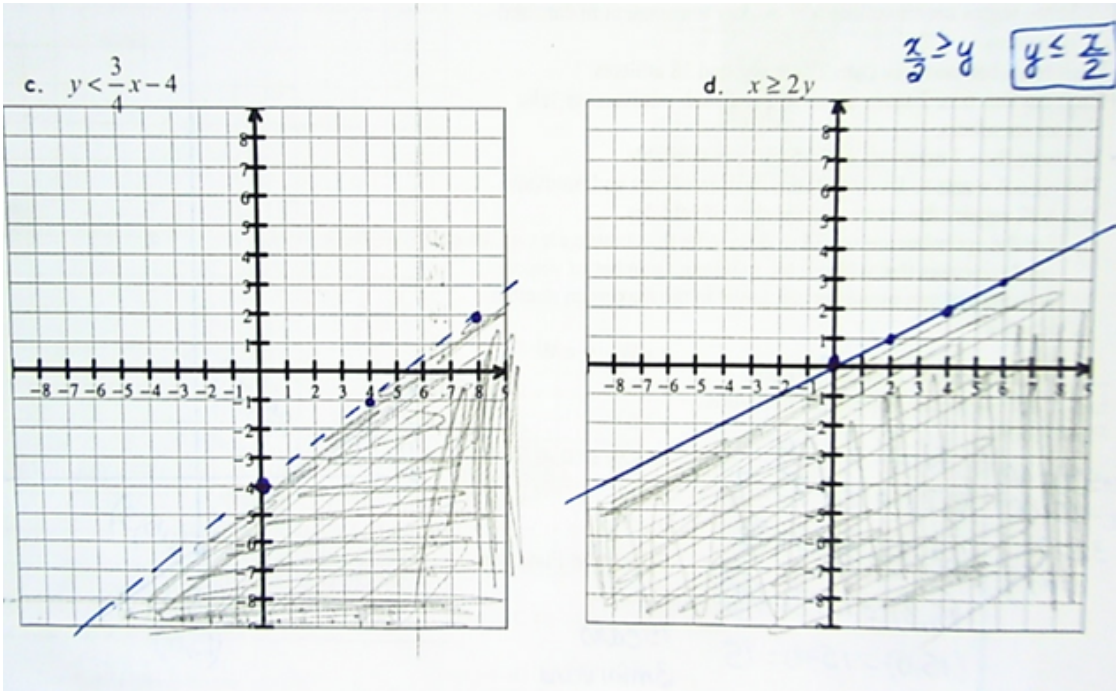
2.

a. $y>-4x+5$



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





3. Given the following constraints, graph each:

a. $x \in R$, $y \in R$

$x \leq 7$

$y > -5$

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

$2x + 3y \geq 18$

b. $x \geq 0$

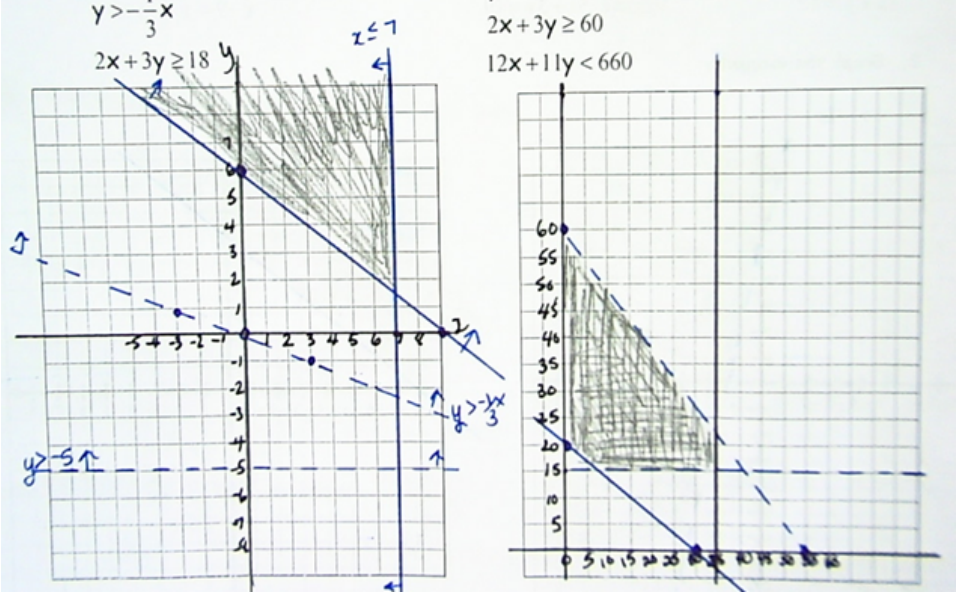
$y \geq 0$

$x \leq 35$

$y > 15$

$2x + 3y \geq 60$

$12x + 11y < 660$



4. Three teams are travelling to a hockey tournament in cars and minivans.

- Each team has no more than 2 coaches and 18 athletes.
- Each car can take 3 team members, and each minivan can take 5 team members.
- No more than 7 minivans and 15 cars are available.

The school wants to know the combination of cars and minivans that will require the maximum number of vehicles.

a) Use the optimization model to determine the combination of cars and minivans that will use the maximum number of vehicles.

b) How many team members can travel in the maximum number of vehicles?

Let x represent the number of cars.
Let y represent the number of minivans.
Restrictions:

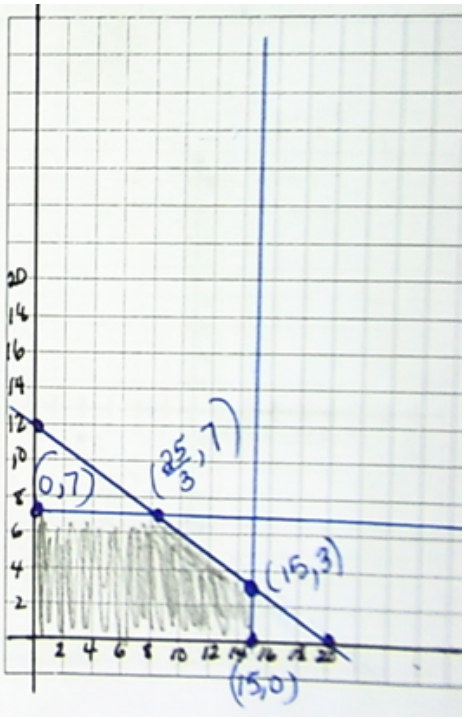
$x \in W \quad y \in W$
$x \geq 0$
$y \geq 0$
$3x + 5y \leq 60$
$x \leq 15$
$y \leq 7$

Objective Function
$N = x + y$

$3x+5(7)=60$
$3x+35=60$
$3x=25$
$x=25/3$

$N = x + y$
$(0,7) = 0+7 = 7$
$(\frac{25}{3},7) = \frac{25}{3}+7 = \frac{46}{3}$
$(15,3) = 15+3 = (18)$
$(15,0) = 15+0 = 15$

15 cars
3 minivans



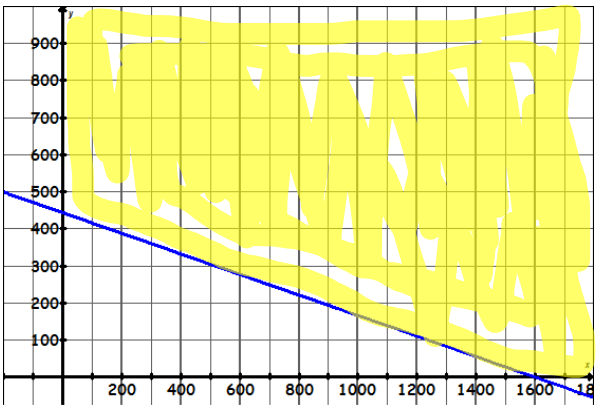
Ans: 15 cars, 3 minivans

this point is not justified because you cannot have 25/3 cars....

5. x = school friends
y = karate friends
$x + y \leq 460$
$x \geq 2y$

6. x = # salami
y = # cheese
$x + y \leq 820$
$3x \geq 2y$

7. x = # bouquets
y = # tickets
$5x + 18y \geq 8000$



8. x = # hotdogs
y = # hamburgers

$x + y \leq 250$

$x \leq 200$

$y \leq 120$

$P = 3x + 5y$

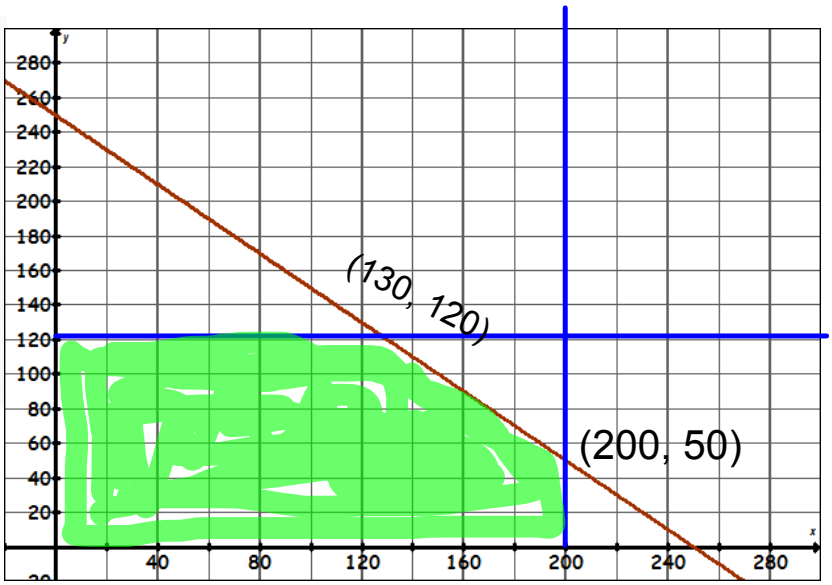
(0,0) P = 0

(0, 120) P = 600

(130, 120) P = 990 max

(200, 50) P = 850

(200, 0) P = 600



9. x = # hot dogs

y = # sausages

$x + y \leq 400$

$y \geq 2x$

$P = 2.50x + 3.50y$

$P = 2.50x + 3.50y$

$(0,0) = 0$

$(400,0) = 1000$

$\left(\frac{400}{3} + \frac{800}{3}\right) = \frac{3800}{3} = 1266.\overline{6}$ max