

# 4 step process

The area of a parking lot is 600 square meters. A car requires 6 square meters. A bus requires 30 square meters. The attendant can handle only 60 vehicles. If a car is charged \$2.50 and a bus \$7.50, how many of each should be accepted to maximize income?

Step 1: underline profit/cost + info

Step 2:   
 (star) hardest step

	sq. meters	vehicle amount	categories
Car (x)	6x	x	
Bus (y)	30y	y	
Total	600	60	

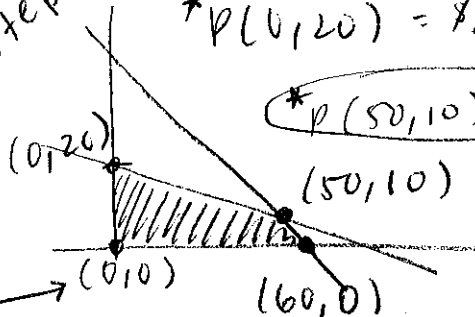
$$6x + 30y \leq 600$$

$$x + y \leq 60$$

$$y \geq -x + 60$$

$$y \geq -0.2x + 20$$

Step 3:



pick x & y  
 $P = \$2.50x + \$7.50y$

$$*P(0,20) = \$2.50(0) + 7.50(20) = \$150$$

$$*P(50,10) = \$2.50(50) + 7.50(10) = \$200$$

$$*P(60,0) = \$2.50(60) + 7.50(0) = \$150$$

50 cars & 10 buses

Step 4:

Toys-A-Go makes toys at Plant A and Plant B. Plant A has materials to make up to 1000 toy dump trucks and fire engines. Plant B has materials to make up to 750 toy dump trucks and fire engines. Plant A can make 10 toy dump trucks and 5 toy fire engines per hour. It costs \$300 per hour to operate Plant A and \$350 to operate Plant B per hour. How many hours should each plant be run in order to maximize profit?

maximize profit?

$$P = \$300x + \$350y$$

Set up 2x2 w/ categorical then decide where total should go

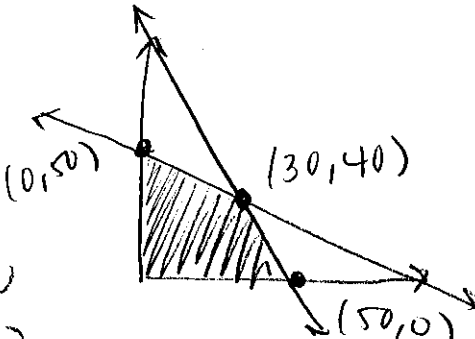
	A	B
dump	10	5
fire	5	15
Total	1000	750

$$10x + 5y \leq 1000$$

$$5x + 15y \leq 750$$

$$\rightarrow y \leq -1/3x + 50$$

$$\rightarrow y \leq -2x + 100$$



$$P(0,50) = 300(0) + 350(50) = 17,500$$

$$P(30,40) = 300(30) + 350(40) = 23,000$$

$$P(50,0) = 300(50) + 350(0) = 15,000$$

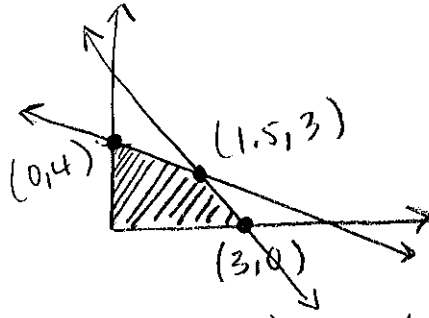
30 dump, 40 fire

can produce 5 & 15

The B & W Leather Company wants to add handmade belts and wallets to its product line. Each belt nets the company \$18 in profit, and each wallet nets \$12. Both belts and wallets require cutting and sewing. Belts require 2 hours of cutting time and 6 hours of sewing time. Wallets require 3 hours of cutting time and 3 hours of sewing time. ~~3 hrs cut~~ ~~if machine is available 12 hours a week of sewing machine is available 18~~ hours per week, what ratio of belts and wallets will produce the most profit within the constraints?

$$P = \$18x + \$12y$$

	cutting	sewing
belts	2	6
wallet	3	3
total	12	18



$$2x + 3y \leq 12$$

$$6x + 3y \leq 18$$

$$\rightarrow y \leq -2x + 4$$

$$\rightarrow y \leq -2/3x + 4$$

$$P(0,4) = 18(0) + 12(4) = 48$$

$$P(1.5,3) = 18(1.5) + 12(3) = 63$$

$$P(3,0) = 18(3) + 12(0) = 54$$

1.5 belts & 3 wallets