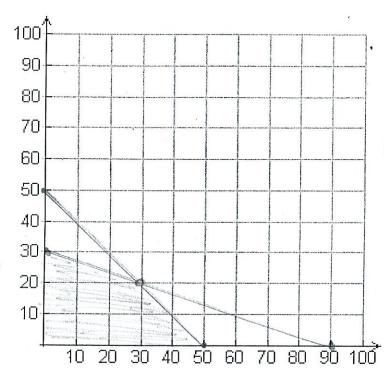
1. A machine shop produces two types of items, type X and Type Y. The production of these items requires the use of two machines, Machine A and Machine B. To produce one type X item requires 1 hour on Machine A and 1 hour on Machine B. To produce one type Y item requires Machine A for 1 hour and Machine B for 3 hours. Machine A is available only 50 hours per week, while Machine B is available for up to 90 hours a week. The machine shop can make a profit of \$2.00 on every type; X item sold and \$3.00 on every type Y item sold. The owners of the machine shop, the Greedy brothers, have agreed to pay you a handsome consulting fee if you can help them to maximize their profits. So your task is to determine how many of each type of item they should make each week to give them the largest possible profit.





## CONSTRAINTS:

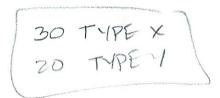
MACHINE A: 50≥ 1× HY

MACHINEB: 90 > 1x+3y

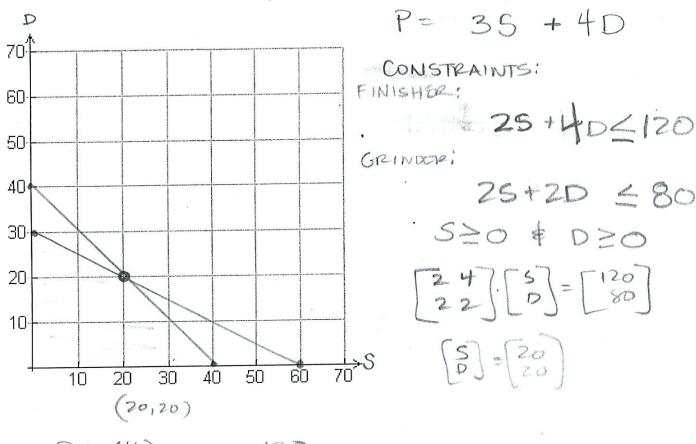
$$\begin{bmatrix} 1 \\ 1 \\ 3 \end{bmatrix} \begin{bmatrix} 3 \\ 4 \end{bmatrix} = \begin{bmatrix} 50 \\ 90 \end{bmatrix}$$

$$\begin{bmatrix} 30 \\ 20 \end{bmatrix} = A^{-1}B = \begin{bmatrix} 30 \\ 20 \end{bmatrix}$$

(50,0) 
$$P=2(50)+3(0)=100$$
  
(50,20)  $P=2(30)+3(20)=120$   
(30,20)  $P=2(30)+3(20)=90$ 



2. Mike's Famous Toy Trucks manufactures two kinds of two trucks—a standard version and a deluxe model. In the manufacturing process, each standard model requires two hours of grinding and two hours of finishing; each deluxe model requires two hours of grinding and four hours of finishing. The company employs two grinders and three finishers, each of whom works 40 hours per week. Each standard model brings the company a profit of \$3.00 and each deluxe model brings a profit of \$4.00. Assuming that every truck made will be sold, how many of each should be made to maximize profits?



$$P=3(40)+0=120$$
  
 $P=3(20)+4(20)=140$  max  
 $P=3(0)+4(30)=120$ 

20 STANDARD 20 DELUXE