

Linear Programming Day 7

14) $x = \#$ of tons of beans from supplier A
 $y = \#$ of tons of beans from supplier B

Objective quantity: $\text{Cost} = 125x + 200y$

Constraints:

$$.2x + .4y \geq 280$$

$$.5x + .20y \geq 200$$

A(0,1000)

B(150,625)

C(1400,0)

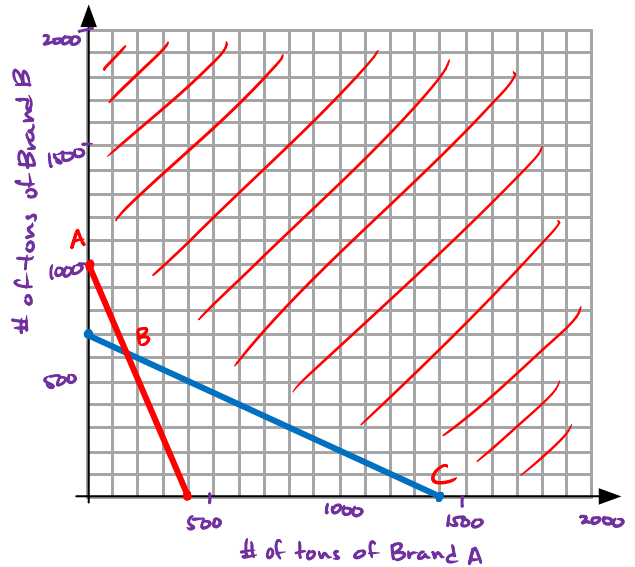
$$\begin{cases} .2x + .4y \geq 280 \\ .5x + .20y \geq 200 \end{cases}$$

Minimize
 Test: $125x + 200y$

A) 200,000

B) 143,750

C) 175,000



Minimum cost is \$143,750
 when buying 150 tons from Supplier A & 625 tons from supplier B.

19) $x = \#$ of vans
 $y = \#$ of buses

Objective Quantity: $15x + 25y$

Constraints:

$$10,000x + 20,000y \leq 100,000$$

$$100x + 75y \leq 500$$

Corner Pts:

A(0,5)

B(2,4)

C(5,0)

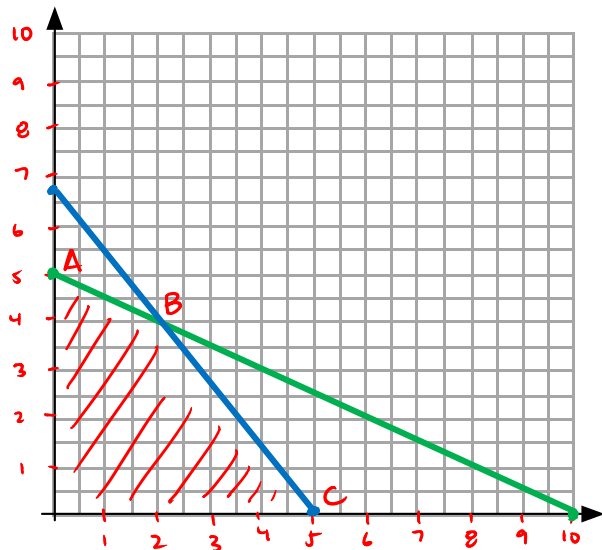
$$\begin{cases} 10,000x + 20,000y = 100,000 \\ 100x + 75y = 500 \end{cases}$$

Test: $15x + 25y$

A: 125 people

B: 130 people

C: 75 people



A maximum of 130 people
 can be transported when
 2 vans and 4 buses are purchased.

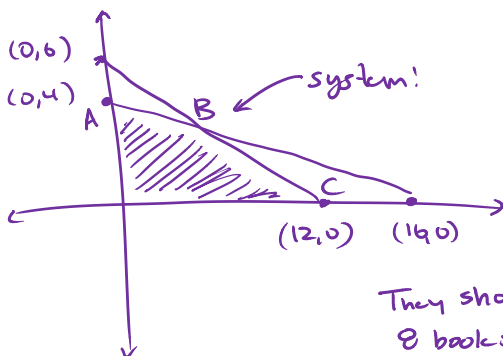
- 1b) $x = \#$ of bookshelves manufactured
 $y = \#$ of desks manufactured

Objective quantity: $20x + 50y = \text{Profit}$

Constraints:

$$\frac{1}{2}x + 2y \leq 8$$

$$x + 2y \leq 12$$



Corner pts: $(0,4)$

$(12,0)$

$(8,2)$

Point B:
$$\begin{cases} \frac{1}{2}x + 2y = 8 \\ x + 2y = 12 \\ x = -2y + 12 \end{cases}$$

$$\frac{1}{2}(-2y + 12) + 2y = 8$$

$$-y + 6 + 2y = 8$$

$$y = 2$$

$$x = 8$$

They should manufacture
 8 bookshelves & 2
 desks for a profit of \$260.

- 1c) $x = \#$ of bags of peanuts
 $y = \#$ of bags of candy

Profit: Revenue - Cost

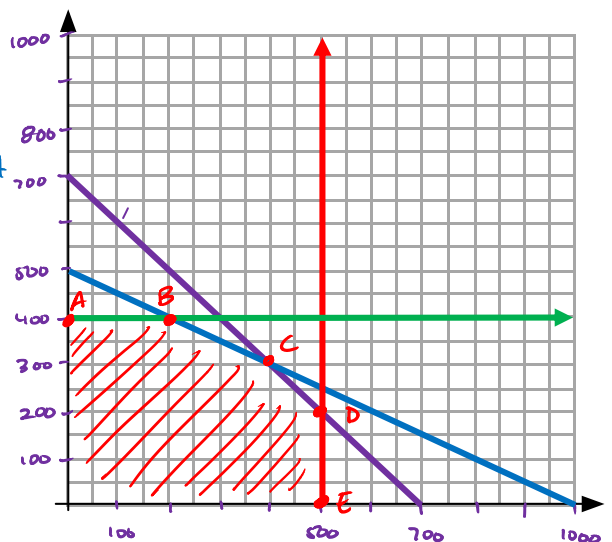
Objective Quantity: $.6x + .8y = \text{Profit}$

Constraints:

$$x \leq 500 \quad y \leq 400$$

$$x + y \leq 700$$

$$.4x + .8y \leq 400$$



A $(0, 400)$

B $(200, 400)$ -
$$\begin{cases} .4x + .8y = 400 \\ y = 400 \end{cases}$$

C $(400, 300)$ -
$$\begin{cases} x + y = 700 \\ .4x + .8y = 400 \end{cases}$$

D $(500, 200)$ -
$$\begin{cases} x = 500 \\ x + y = 700 \end{cases}$$

E $(500, 0)$

Test pts: $.6x + .8y$

A) \$320

B) \$440

C) \$480

D) \$460

E) \$300

Max profit of \$480
 when selling 400 bags of
 peanuts & 300 bags of candy.