

warm Up

Mr. McDonald has 20 days to plant corn and soybeans. The corn can be planted at a rate of 25 acres per day, and the soybeans can be planted at a rate of 20 acres per day, and he has 450 available acres to plant. Mr. McDonald makes a profit of ~~\$26~~ on each acre of corn, and ~~\$30~~ on each acre of soybeans. How many of acres of each crop should Mr. McDonald plant to maximize his profit?

1) Define the variables

$X = \text{corn}$
 $Y = \text{soy beans}$

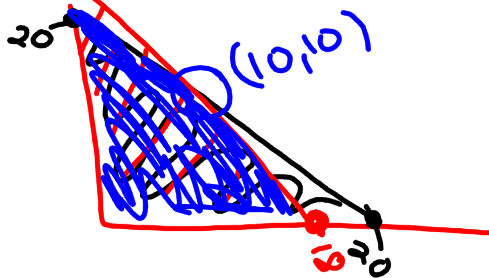
2) Objective Function

$26x + 30y$ (MAX)

3) Constraints

$x + y \leq 20$ (0,20) (20,0)
 $25x + 20y \leq 450$ (18,0) (0,22.5)

4) Graph



5) Point of intersection

$$\begin{array}{r} -20(x+y=20) \quad 10+y=20 \\ 25x+20y=450 \quad y=10 \\ \hline -20x-20y=-400 \\ 5x=50 \quad (10,10) \\ x=10 \end{array}$$

6) Vertices of feasible region

(0,0) (18,0) (10,10) (0,20)

7) Find the max or min

$26(10) + 30(10) = 560$
 ~~$26(18) + 30(0) = 468$~~
 ~~$26(0) + 30(20) = 600$~~

- ① $x = \text{chair}$
① $y = \text{table}$
- ② $15x + 20y$ **Max**
- ③ $x + 2y \leq 6$
 $2x + 2y \leq 8$

Crops

$$30x + 60y \text{ (Max)}$$

$$x + y \leq 100$$

$$120x + 200y \leq 15000$$

Computers

$$45x + 50y \text{ (Max)}$$



Homework Questions?

White Board Review

Your overall grade in Math class is a weighted average of three components: homework, quizzes, and tests.

Homework = 20%, Quizzes = 30%, and tests = 50%. Organize the information in the chart below into a matrix (A) and multiply by the matrix of weights (B) and find each students overall grade

a) Organize in to matrices

	Homework	Quizzes	Tests
Ann	82	88	86
Melissa	92	88	90
Scott	82	73	81
Ryan	74	75	78
Jenn	88	92	90

.20 .30 .50

.20
.30
.50

b) Find each overall grade

85.8% 89% 78.8% 76.3% 90.2%

① $-(3x + y = -2)$

$$\begin{array}{r} 2x^2 + y = 0 \\ -3x - y = 2 \\ \hline \end{array}$$

$$2x^2 - 3x - 2 = 2$$

$$\begin{array}{r} -4 \\ -3 \\ \hline \end{array}$$

$$\begin{aligned} 2x^2 - 3x - 2 &= 0 \\ (2x^2 - 4x) + (1x - 2) &= 0 \\ 2x(x-2) + 1(x-2) &= 0 \end{aligned}$$

$$(2x+1)(x-2) = 0$$

$$x = -\frac{1}{2} \quad x = 2$$

$$3(-\frac{1}{2}) + y = -2 \quad 3(2) + y = -2$$

$$y = -\frac{1}{2}$$

$$y = -8$$

$$(-\frac{1}{2}, -\frac{1}{2})$$

$$(2, -8)$$

②

$$\begin{array}{r} x+y=8 \\ xy=15 \end{array}$$

$y = -x + 8$

$$x(-x+8) = 15$$

$$-x^2 + 8x = 15$$

$$\frac{-x^2 + 8x - 15}{-1} = 0$$

$$x^2 - 8x + 15 = 0$$

$$(x-5)(x-3) = 0$$

$x = 5$	$x = 3$
$5y = 15$	$3y = 15$
$y = 3$	$y = 5$

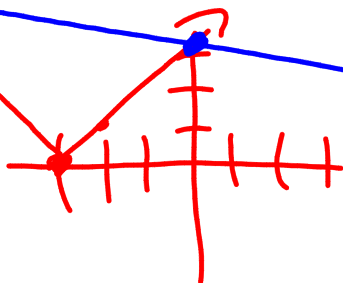
$$\textcircled{1} \quad y = |x + 3| \quad \textcircled{0} \quad y = a|x - h| + k$$

$$\rightarrow x + 7y = 21$$

$$\frac{7y}{7} = \frac{-x + 21}{7}$$

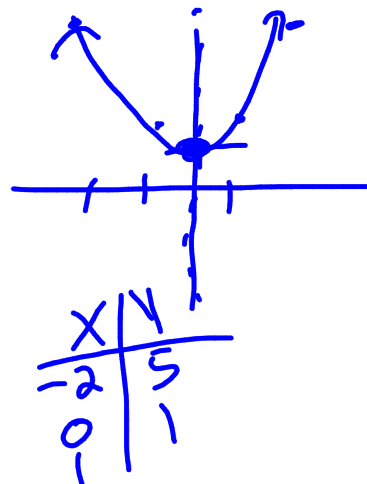
$$y = -\frac{1}{7}x + 3$$

$$V(h, k)$$
$$V(-3, 0)$$



$$y = x^2 + 1$$

$$y = ax^2 + bx + c$$
$$v\left(\frac{-b}{2a}, \right) v(0, 1)$$
$$x = \frac{-b}{2a} = 0$$



White Board Review

Mr. Bronson invest \$6400-part at 2% and the rest of 4%. Find the amount invested at each rate of interest in the total annual return is \$224.

$$\begin{aligned} &-.02(X + Y = 6400) \\ &.02x + .04y = 224 \end{aligned}$$

$$\begin{aligned} X &= \$1600 \\ Y &= \$4800 \end{aligned}$$

[https://create.kahoot.it/?
_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-
d5212ce69534#quiz/a65d3ecb-94ae-4985-8149-cb695161b1a9](https://create.kahoot.it/?_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/a65d3ecb-94ae-4985-8149-cb695161b1a9)

White Board Review

$$\begin{bmatrix} \underline{1} & 2 \\ 3 & 4 \end{bmatrix} + \begin{bmatrix} \underline{-5} & -4 \\ -3 & -2 \end{bmatrix} = \begin{bmatrix} -4 & -2 \\ 6 & 2 \end{bmatrix}$$

2×2 2×2

White Board Review

$$\begin{bmatrix} -10 \\ -9 \\ -8 \end{bmatrix} - 2 \begin{bmatrix} -1 & -2 \\ -3 & -4 \end{bmatrix} =$$

$$\begin{bmatrix} -1 \\ 2 \\ 3 \end{bmatrix} - 2 \begin{bmatrix} -1 & -2 \\ -3 & -4 \end{bmatrix}$$

Not possible

White Board Review

$$\begin{bmatrix} 2 \\ 3 \end{bmatrix} \begin{bmatrix} 4 \end{bmatrix} 5 = \begin{bmatrix} 8 & 10 \\ 12 & 15 \end{bmatrix}$$

2×1 1×2
New

White Board Review

$$-2 \begin{bmatrix} 1 \\ 0 \end{bmatrix} - \begin{bmatrix} 5 & 6 \\ 7 & 8 \end{bmatrix} \begin{bmatrix} -1 \\ 1 \end{bmatrix} =$$

2×2 2×1

$$\begin{bmatrix} -2 \\ 0 \end{bmatrix} - \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$\begin{bmatrix} -3 \\ -1 \end{bmatrix}$$

White Board Review

$$-2x - 9 = 3^2 \begin{bmatrix} 8 & -x \\ 5 & 6 \end{bmatrix} - \begin{bmatrix} 3 & -9 \\ 10 & -4y \end{bmatrix} = \begin{bmatrix} 13 & 3 \\ 0 & 16 \end{bmatrix}$$

$$-2x + 9 = 3^2 \begin{bmatrix} 16 & -2x \\ 10 & 12 \end{bmatrix} - \begin{bmatrix} 3 & -9 \\ 10 & -4y \end{bmatrix} = \begin{bmatrix} 13 & 3 \\ 0 & 16 \end{bmatrix}$$

$$\frac{-2x}{2} = \frac{-16}{2}$$

$$x = 3$$

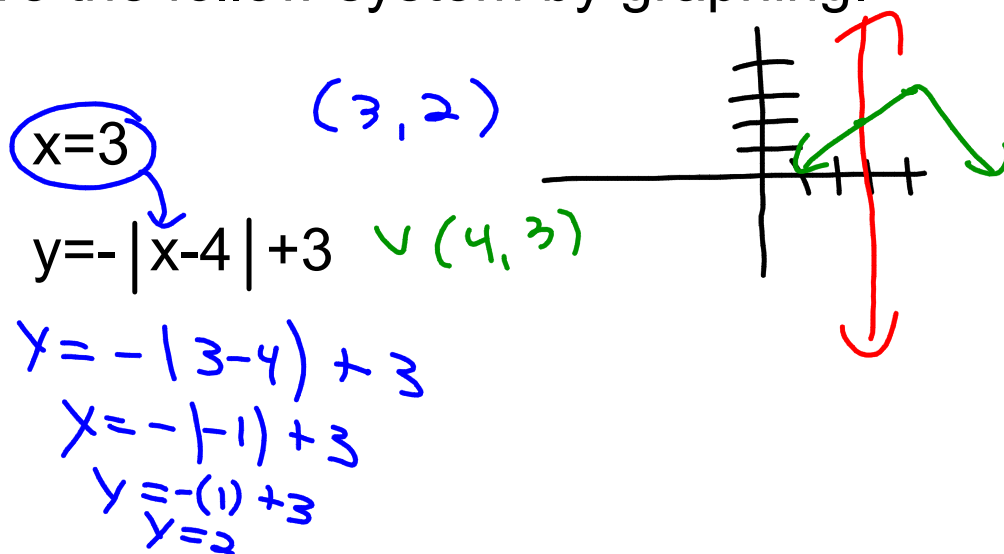
$$\frac{1}{2} + 4x = \frac{16}{2}$$

$$4x = 4$$

$$x = 1$$

White Board Review

Solve the follow system by graphing.



Matrices

[https://create.kahoot.it/?](https://create.kahoot.it/?_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/95f139a3-2992-4699-8daf-4608e914fb19)

[_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/95f139a3-2992-4699-8daf-4608e914fb19](https://create.kahoot.it/?_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/95f139a3-2992-4699-8daf-4608e914fb19)

•

[https://create.kahoot.it/?](https://create.kahoot.it/?_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/3ca7a609-8bc4-409f-a939-02df2b7890fb)

[_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/3ca7a609-8bc4-409f-a939-02df2b7890fb](https://create.kahoot.it/?_ga=1.232194135.950889830.1446222497&deviceId=8fd694f8-dc82-4f06-9aa4-d5212ce69534#quiz/3ca7a609-8bc4-409f-a939-02df2b7890fb)

•

Final Review

* Error on # 1
↳ Just answer

* #24 + #26 same