

# Systems of Inequalities

$$3x - 4y \geq 12$$

$$y < -\frac{2}{3}x + 4 \leftarrow y\text{-int}$$

(0,0)

$$0 < -\frac{2}{3}(0) + 4$$

$$0 < 4$$

true

$$\begin{array}{r} 3x - 4y \geq 12 \\ -3x \quad -3x \end{array}$$

$$\frac{-4y}{\textcircled{-4}} \geq \frac{-3x + 12}{\textcircled{-4}}$$

$$y \leq \frac{3}{4}x - 3 \leftarrow y\text{-int}$$

$\left. \begin{array}{l} \text{true} \\ \text{true} \end{array} \right\} \text{true}$

$$\begin{array}{l} 3(0) - 4(0) \geq 12 \\ 0 \geq 12 \\ \text{false} \end{array}$$

$$y \leq \frac{1}{3}x - 2 \leftarrow y\text{-int}$$

$\frac{1}{3}$   $\frac{up\ 1}{3}$  right

$$5x - 3y > 15$$

$$0 > 15$$

false

$$\begin{array}{l} \cancel{5x} - 3y > 15 \\ \frac{-3y}{-3} > \frac{15}{-3} \\ y < -5 \end{array}$$

$$\frac{5x}{5} > \frac{15}{5}$$

$$x > 3$$

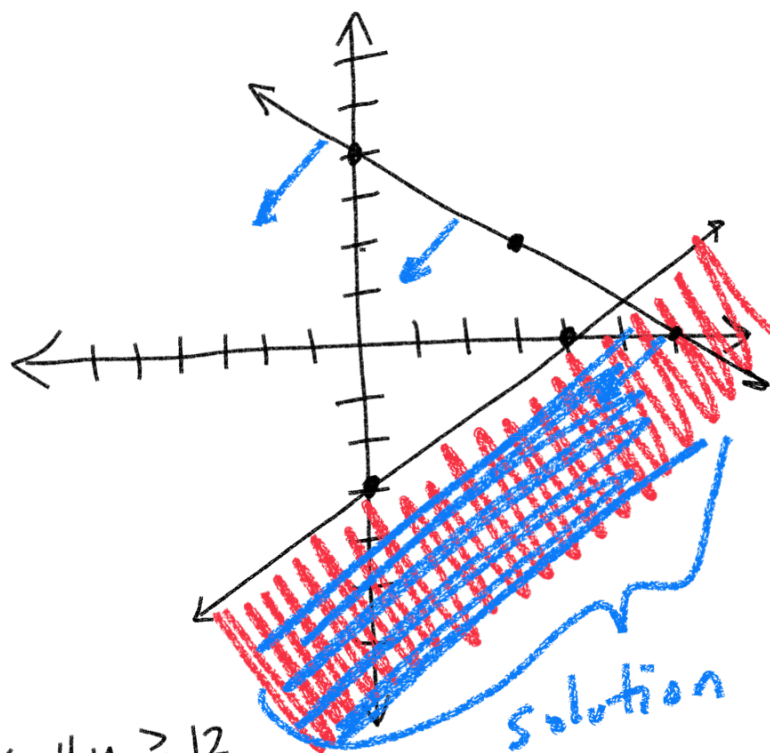
(3,0)

$$y \leq \frac{1}{3}x - 2$$

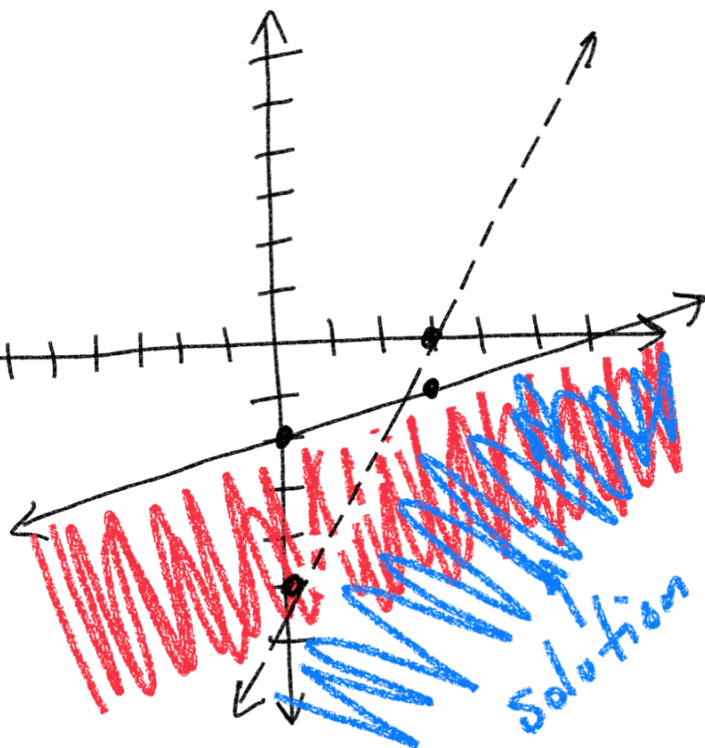
$$0 \leq \frac{1}{3}(0) - 2$$

$$0 \leq -2$$

false



Solution



Solution

# 3-4 Linear Programming

(NC)  $x + y \leq 4$   $0 \leq 4$  true!  
 $x = \text{otters}$

(TN)  $6x + 3y \leq 18$   $0 \leq 18$  true  
 $\checkmark x \geq 0$   
 $\checkmark y \geq 0$  } Quadrant I

Max  
 $P = 25,000x + 40,000y$   
 $\$$

$P = 25,000x + 40,000y$

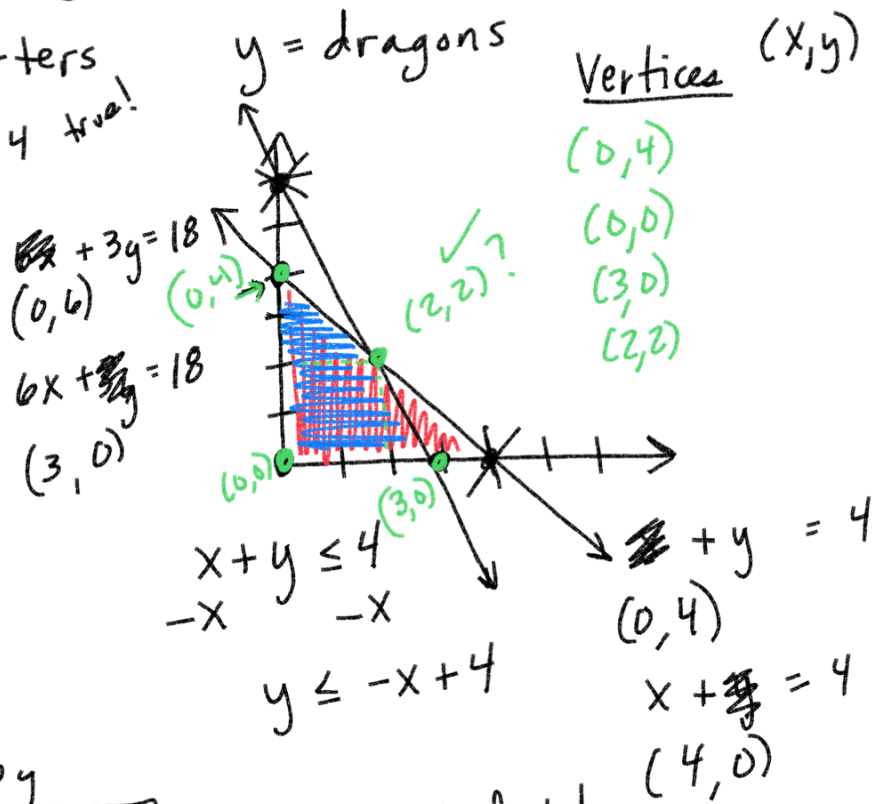
$(0, 4)$   $25,000(0) + 40,000(4) = \$160,000$

$(0, 0)$   $25,000(0) + 40,000(0) = \$0$

$(3, 0)$   $25,000(3) + 40,000(0) = \$75,000$

$(2, 2)$   $25,000(2) + 40,000(2) = \$130,000$   
 $50,000 + 80,000$

$(0, 4)$



Step 1: Graphed like a system of inequalities

Step 2: Find vertices

Step 3: Use vertices in the given formula

$$\begin{cases} x + y \leq 5 \\ x + 2y \leq 8 \end{cases}$$

$x \geq 0$   
 $y \geq 0$  } Quadrant I

Max

$$P = x + 3y$$

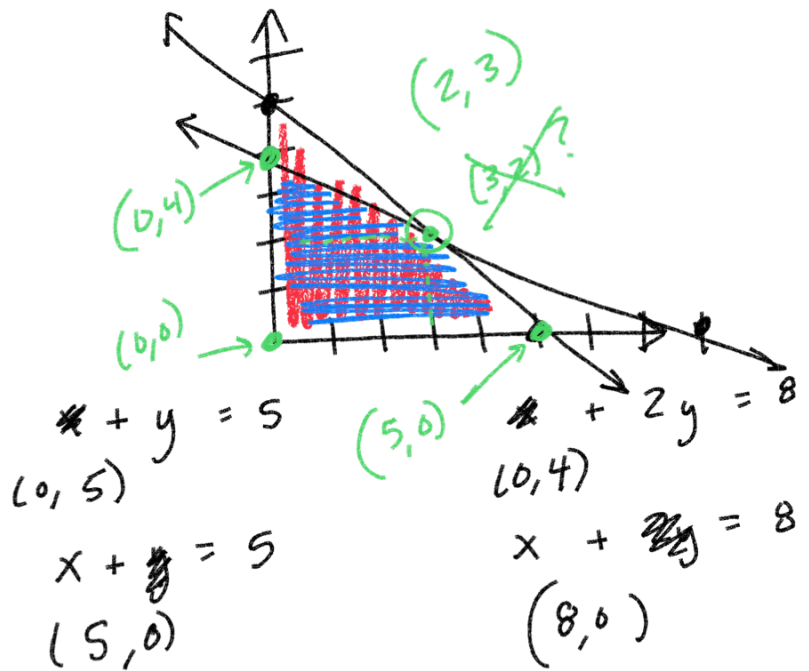
$(0, 4)$	$0 + 3(4) = 12$
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$(0, 0)$	$0 + 3(0) = 0$
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$(5, 0)$	$5 + 3(0) = 5$
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$(2, 3)$	$2 + 3(3) = 11$
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$(0, 4)$
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$$\begin{array}{r} x + y = 5 \\ -x + 2y = -8 \\ \hline -y = -3 \\ y = 3 \end{array}$$

$$\begin{array}{r} x + y = 5 \\ x + 3 = 5 \\ -3 \quad -3 \\ \hline x = 2 \end{array}$$

HW  
ch 3.4 p 34 1-6  
online HW 17 }  
Quiz 17 } Feb 10<sup>th</sup>  
HW/Quiz 15 due tonight  
HW/Quiz 16 Feb 3<sup>rd</sup>

