

# SOLUTIONS...

PUZZLE WORKSHEET:

**What Did the Toothless Old Termite Say When He Entered a Tavern?**

Graph each pair of inequalities below and indicate the solution set of the system with crosshatching or shading. The crosshatching or shading, if extended, would cover a set of three letters. Print these letters in the three boxes at the bottom of the page that contain the exercise number.

①  $y < x - 1$   
 $y > -3$

②  $x < 2$   
 $y < \frac{2}{3}x - 1$

③  $y < -x + 1$   
 $y > \frac{1}{2}x - 2$

④  $y < x$   
 $3x + 2y > 4$

⑤  $x - 2y < 12$   
 $x > 2$

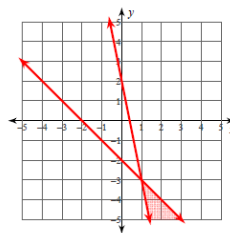
⑥  $y < 1$   
 $2x + y < 1$

4 4 4 3 3 3 6 6 1 1 1 5 5 5 2 2 2  
I S T H E B A R T E N D E R H E R E

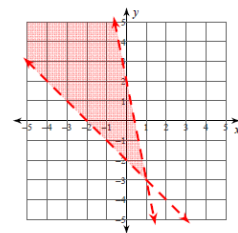
200 1989 Creative Publications

WORKSHEET:

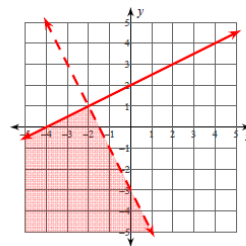
1)  $y \leq -x - 2$   
 $y \geq -5x + 2$



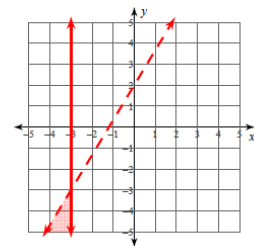
2)  $y > -x - 2$   
 $y < -5x + 2$



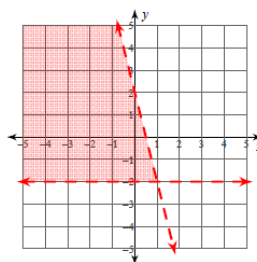
3)  $y \leq \frac{1}{2}x + 2$   
 $y < -2x - 3$



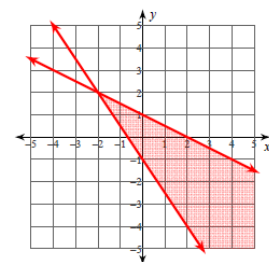
4)  $x \leq -3$   
 $y < \frac{5}{3}x + 2$



5)  $4x + y < 2$   
 $y > -2$



6)  $3x + 2y \geq -2$   
 $x + 2y \leq 2$



4)  $x \leq -3$   
 $y < \frac{5}{3}x + 2$

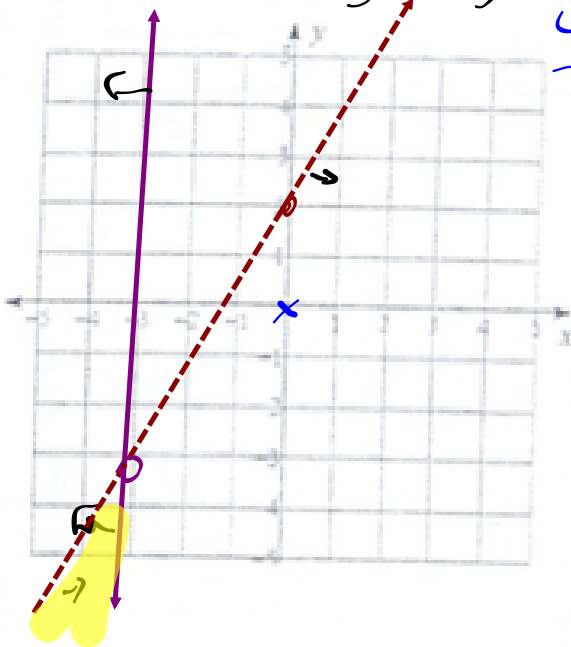
$x \leq -3$

$y < \frac{5}{3}x + 2$

$LS < RS$   
 $0 < \frac{5(-3)}{3} + 2$   
 $< 2$   
yes

$x = -3$  (vertical)

$y = \frac{5}{3}x + 2$   
 $\downarrow$   
 $-\frac{5}{3}$   
 $-3$



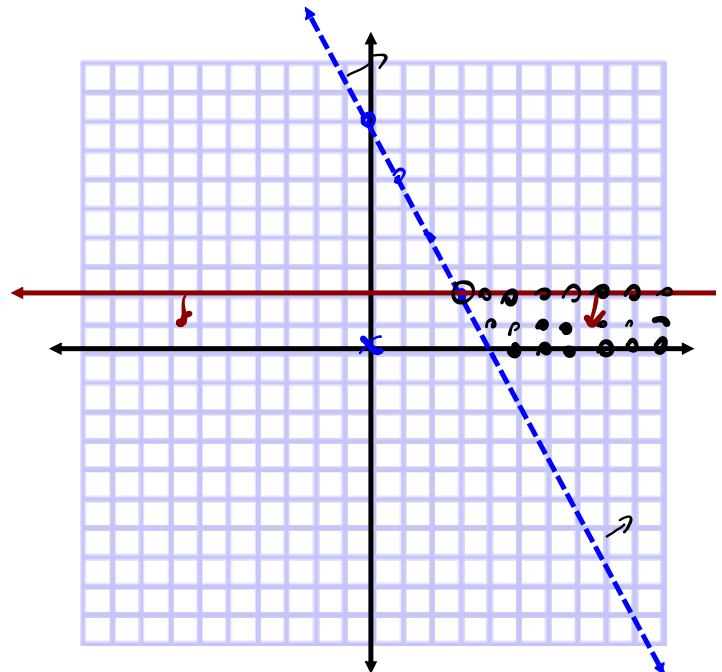
**WARM-UP:** Graph the solution and state 2 possible solutions...

$$\{(x, y) \mid 2x + y > 8, x \in W, y \in W\} \leftarrow \text{Quad 1}$$

$$\{(x, y) \mid y \leq 2, x \in W, y \in W\}$$

$$\begin{array}{l}
 2x + y = 8 \\
 y = -2x + 8 \\
 \text{LS} > \text{RS} \\
 \hline
 2(0) + 0 \quad | \quad 8 \\
 0 > \text{No}
 \end{array}$$

$y = 2$



# Applications: Systems Involving Inequalities

**STEP 1 - Declare Variables**  
State Restrictions

**STEP 2 - Create Linear Inequalities**

**STEP 3 - Graph Solution Set**

**STEP 4 - Answer question(s)**

## EXAMPLE #1:

To raise funds for  $\pi$ - day, the PI Committee has 500 T-shirts to sell.

They have two varieties:

#1. 'I 8 Sum  $\pi$ ' or #2. ' $\pi$ - DAY 2018'.

\* They expect to sell at least twice as many of the first as the second. *1<sup>st</sup> depends on 2<sup>nd</sup>*

$x \rightarrow$  # of  $\pi$  day 2018 shirts  
 $y \rightarrow$  # of I 8 Sum  $\pi$   
 $x \in W$   $y \in W$

a) Define the variables and restrictions. Write a system of linear inequalities that models the situation.

$$x + y \leq 500$$

$$y \geq 2x$$

*graph*

x	y
10	20
30	60
25	50
100	200

b) Graph the system of inequalities.

$$x + y = 500$$

x-int

$$x + 0 = 500$$

$$x = 500$$

$(500, 0)$

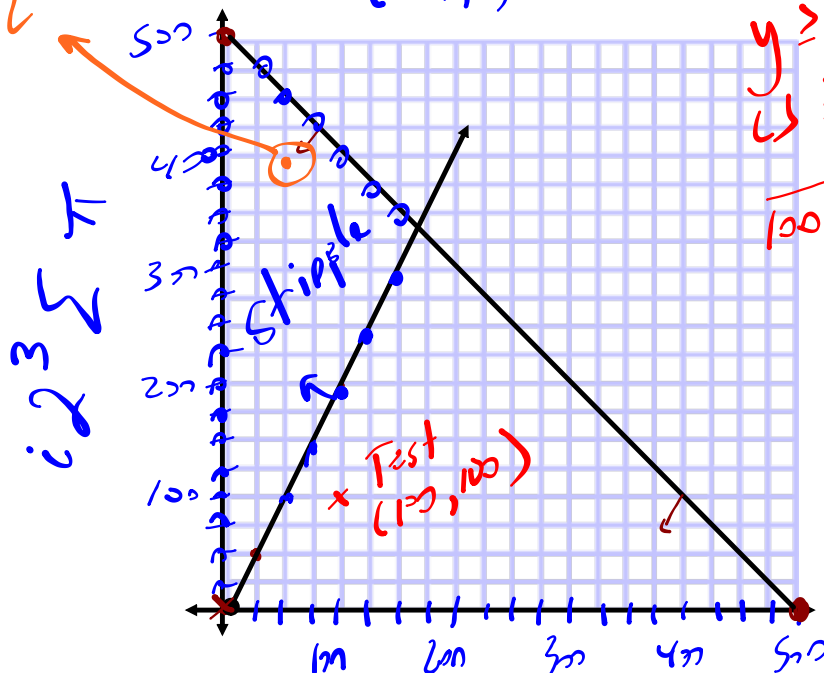
y-int

$$0 + y = 500$$

$(0, 500)$

State a combination of T-shirt sales.

$(50, 400)$   
 $\uparrow$   
 $\pi$  day 2018  
 $i23 \leq \pi$



$y \geq 2x$   
 $\hookrightarrow \geq RS$   
 $100 \quad 2(100)$   
 $\geq 200$   
NO

$\pi$ -day 2018

## **Variables...**

Independent - is plotted on the x axis

ex: time, shots on goal

Dependent - is plotted on they axis

ex: distance, goals scored

REMEMBER... You have ID the XY

ASK YOURSELF... 'What depends on what?'

## **HOMEWORK...**

Quiz Tomorrow

p. 225: #1 & 2

p. 235: #2, 5 & 6