

# 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  $y < x - 1$   
 $y > -3$

TOO

②  $x < 2$   
 $y < \frac{2}{3}x - 1$

ERE

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

TER

④  $y < x$   
 $3x + 2y > 4$

WHO

⑤  $x - 2y < 12$   
 $x > 2$

SEV

⑥  $y < 1$   
 $2x + y < 1$

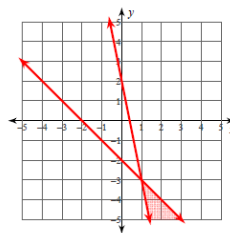
ART

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

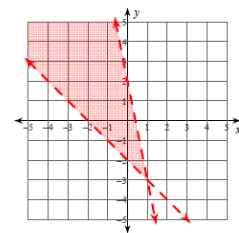
200 1989 Creative Publications

WORKSHEET:

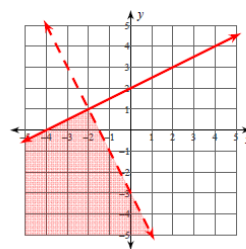
1)  $y \leq -x - 2$   
 $y \geq -5x + 2$



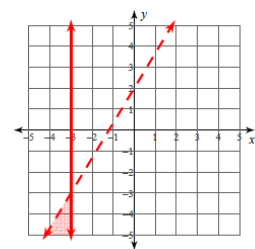
2)  $y > -x - 2$   
 $y < -5x + 2$



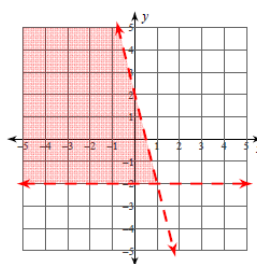
3)  $y \leq \frac{1}{2}x + 2$   
 $y < -2x - 3$



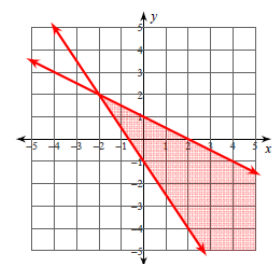
4)  $x \leq -3$   
 $y < \frac{5}{3}x + 2$



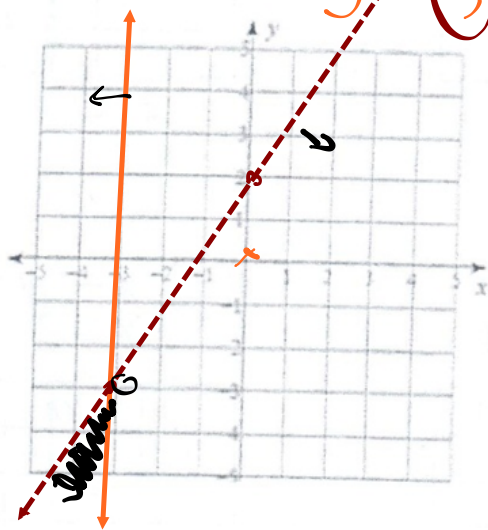
5)  $4x + y < 2$   
 $y > -2$



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



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



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

Test (0,0)

$x = -3$  (vertical)

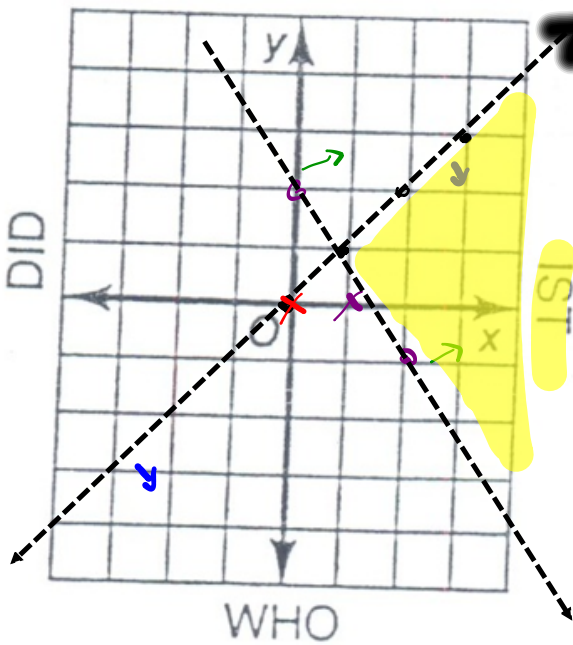
LS < RS  
 $0 < \frac{5(0)}{3} + 2$   
 $0 < 2$  yes

④  $y < x$   
 $3x + 2y > 4$

Test (0,0)  
 $LS > RS$   
 $3(0) + 2(0) > 4$   
 $0 > 4$   
 No

$y = \frac{1}{3}x$

Test (1,0)  
 $LS < RS$   
 $0 < 4$   
 yes



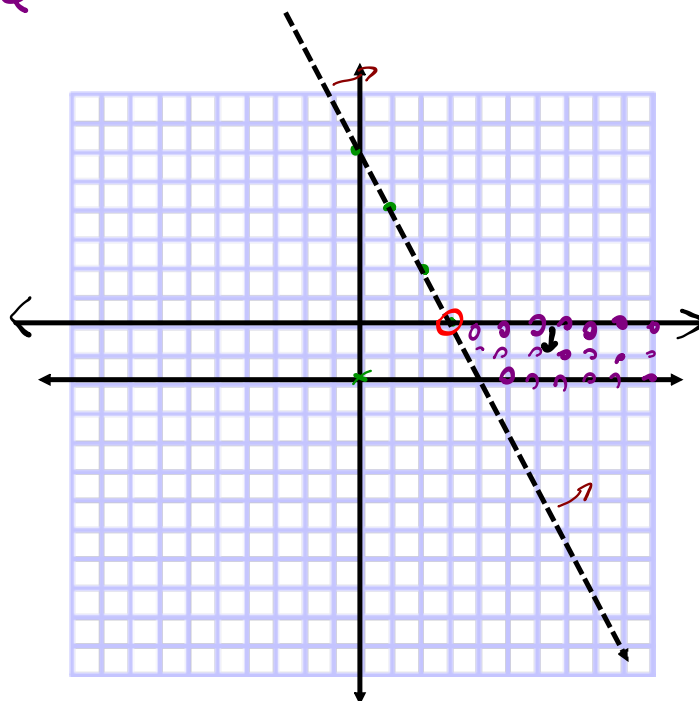
$\frac{dy}{dx} = -\frac{3x + y}{2}$   
 $\frac{dy}{dx} = -\frac{3}{2}x + 2$

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

$\{(x, y) \mid 2x + y > 8, x \in W, y \in W\}$  Stipple  
 $\{(x, y) \mid y \leq 2, x \in W, y \in W\}$  Q1

$y = -2x + 8$   
 LS > RS  

$$\begin{array}{r|l} 2(x) + 0 & 8 \\ 0 & \nearrow R_2 \end{array}$$



# 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. *1st depends on 2nd*

*x* → # of  $\pi$  day 2018 sold  
*y* → # of I 8 Sum  $\pi$  sold  
*x* & *y* ∈  $\mathbb{N}$

$x + y = 500$   
*x* int

$x + 0 = 500$   
 $x = 500$   
 $(500, 0)$

$0 + y = 500$   
 $(0, 500)$

$y = 2x$

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

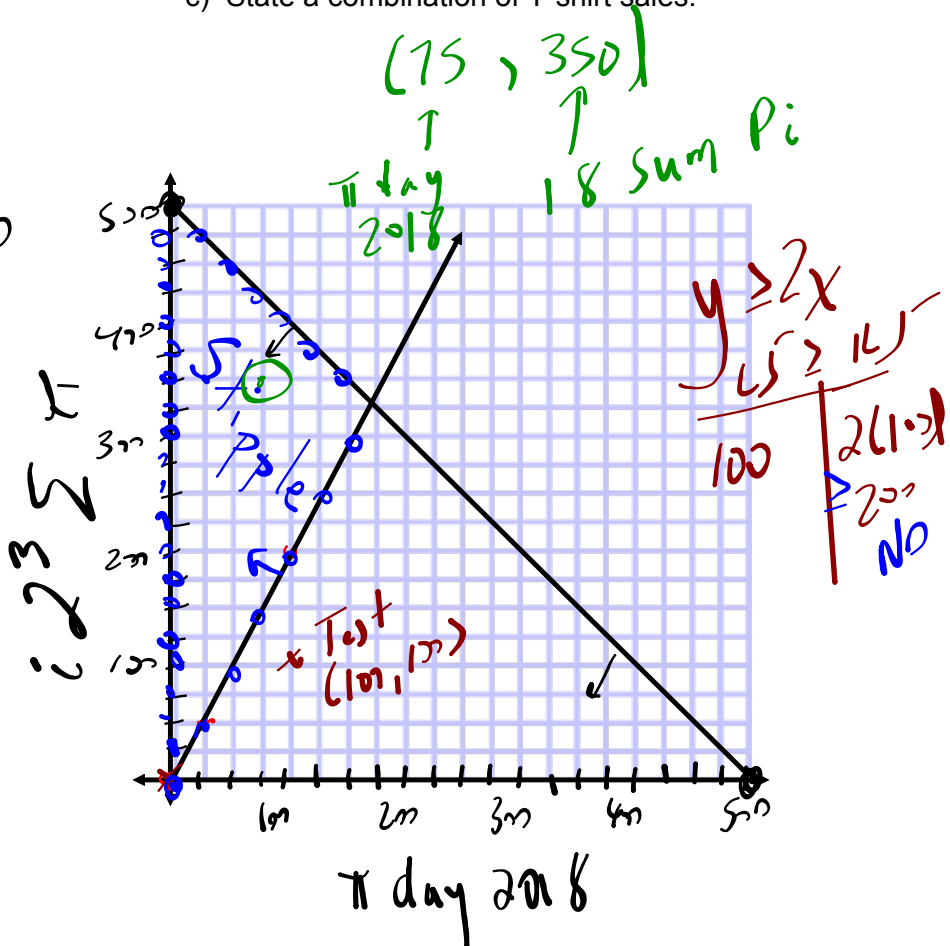
$x + y \leq 500$   
 $y \geq 2x$

$y = 2x$   

x	y
25	50
100	200

b) Graph the system of inequalities.

c) State a combination of T-shirt sales.



## **Variables...**

Independent - is plotted on the x axis

ex: time, shots on goal

Dependent - is plotted on the y axis

ex: distance, goals scored

REMEMBER... You have ID the XY

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

# HOMework...

Quiz

p. 225: #1 & 2

p. 235: #2, 5 & 6

Word problem