Prebell - Handout on systems word problems

*Will be turned in for grade

Systems of 2 Equations Word Problems

1) Traveling to Finland, a plane encounters a tailwind and averages 293 mph. However, on the return trip the plane, now traveling against the same wind averages 247 mph. Find the speed of the wind and the speed of the plane in no wind.

2) An exam worth 348 points contains 44 questions. Some questions are worth 6 points, and the others are worth 9 points. How many 6 point and 9 point questions are on the test?

$6pt - x = 16$
$9pt - y = 28$

$[x + y = 44] - 6$
$6x + 9y = 348$

$x + 28 = 44$
$-28 \quad -28$
$x = 16$

$-6x - 6y = -264$
$6x + 9y = 348$

$\frac{3y}{3} = \frac{84}{3}$

$y = 28$

3) To win a basketball game, one team scored 80 points. They made a total of 33 two-pointers and three-pointers. How many of the baskets were worth 2 points, and how many were 3 pointers?

$2pt - x = 19$
$3pt - y = 14$

$[x + y = 33] \cdot -2$
$2x + 3y = 80$
$-2x - 2y = -66$
$y = 14$

$x + 14 = 33$
$-14 \quad -14$
$x = 19$

4) For a trip, one high school rented and filled 8 vans and 6 buses with 240 students. Another high school instead fit its 120 students into 2 vans and 4 buses. With each bus and van seating the same number of students, how many students can a bus carry? How many students can a van carry?

4. $2x - y = -4$

$2x - y = -2$

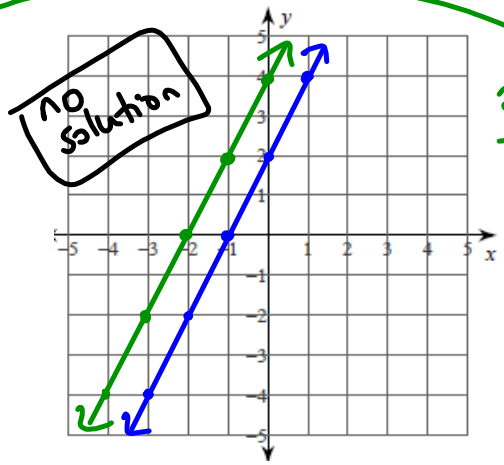
$-2x \quad -2x$

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

$y = 2x + 2$

$m = 2$

$b = 2$



$2x - y = -4$

$-2x \quad -2x$

$\frac{-y}{-1} = \frac{-2x-4}{-1}$

$y = 2x + 4$

7.5 Graphing Inequalities in Two Variables

NOTES

Write your questions here!

Is (4, 3) a solution to $2x - y < 4$?

$2(4) - (3) \overset{?}{<} 4$

$8 - 3 \overset{?}{<} 4$

$5 \not< 4$

NO

Is (-2, 0) a solution to $y < 2x + 4$?

$0 < 2(-2) + 4$

$0 < -4 + 4$

$0 \not< 0$

NO

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Graph Linear Inequalities

$y \le -x - 3$ ↔

$m = -1$

$b = -3$

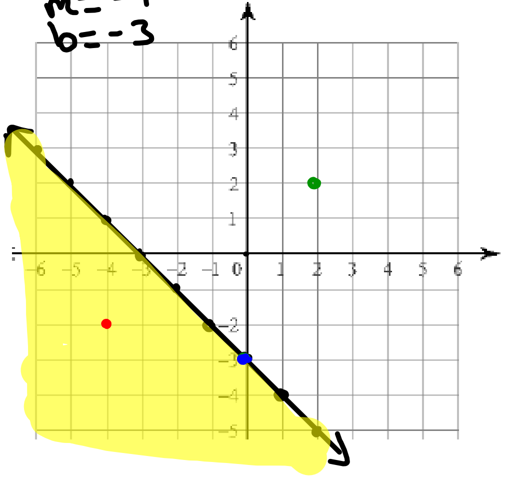
1) Test pts (0,0)

$y \le -x - 3$

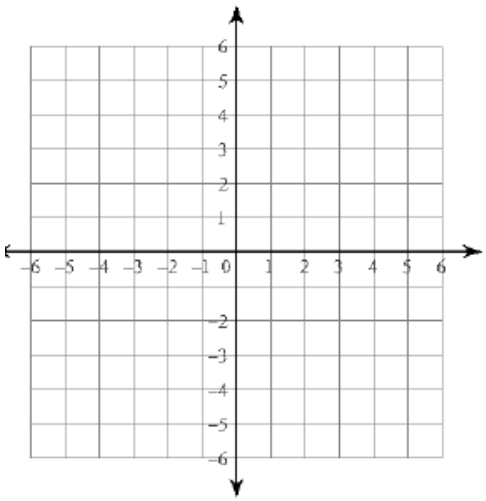
2) $0 \le 0 - 3$

$0 \le -3$

3)



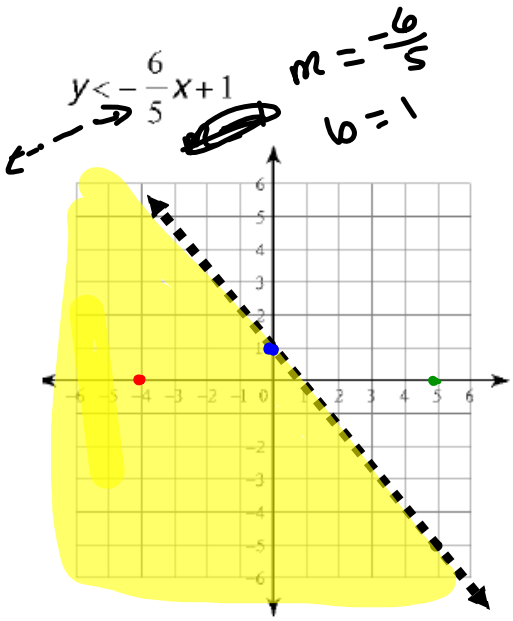
$x + 4y > -20$



$y < -\frac{6}{5}x + 1$

$m = -\frac{6}{5}$

$b = 1$



Shortcut....

If $y > mx + b$ or $y \geq mx + b$, then

If $y < mx + b$ or $y \leq mx + b$, then

[PACKET 8.5: SOLVING SYSTEMS OF INEQUALITIES] 1

A system of linear inequalities in two variables, or simply a system of linear inequalities, consists of two or more linear inequalities in the same variables. For example:

$$x - y > 7$$
$$2x + y < 8$$

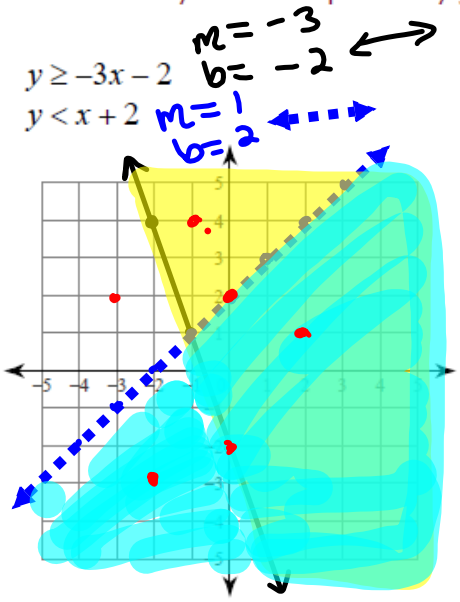
The solution of a system of inequalities is an ordered pair that is a solution of each inequality in the system.

Example1: Is (3, -5) a solution to the system of inequalities above?

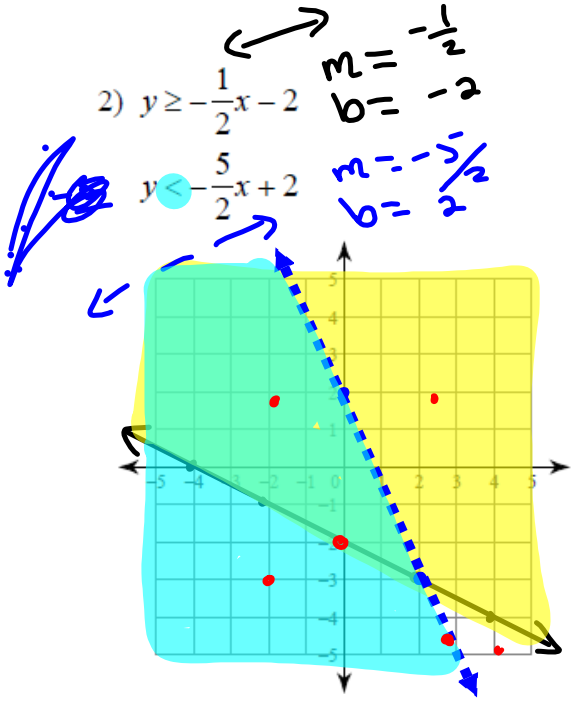
How about (5, -2)?

Solve each system of inequalities by graphing!

1) $y \geq -3x - 2$
$y < x + 2$

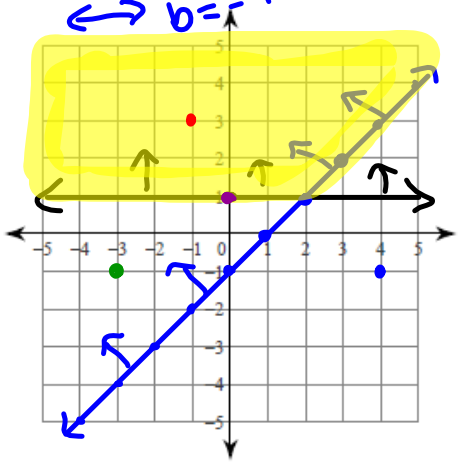


2) $y \geq -\frac{1}{2}x - 2$
$y < -\frac{5}{2}x + 2$



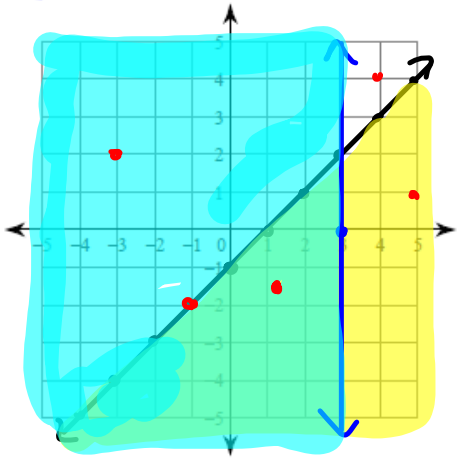
3) $y \geq 1$ $m = 0$ $b = 1$

$y \geq x - 1$ $m = 1$ $b = -1$

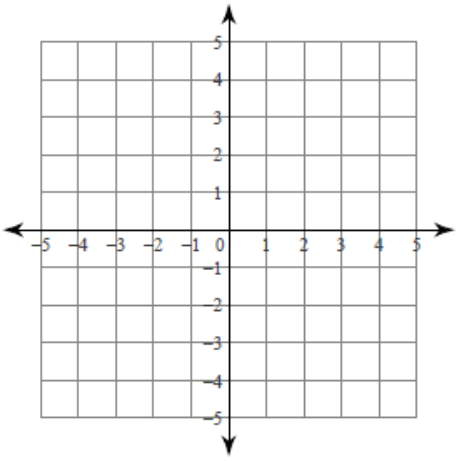


4) $y \leq x - 1$ $m = 1$ $b = -1$

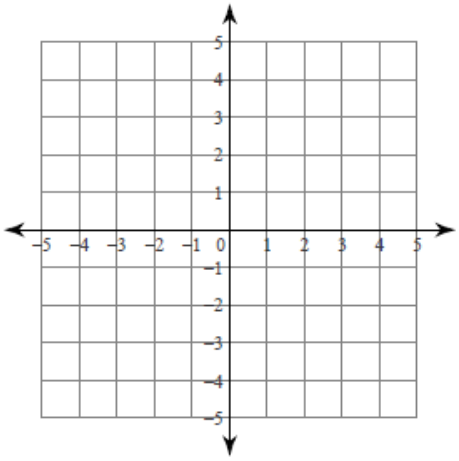
$x \leq 3$ $m = \text{undef}$



5) $x - 2y \geq 2$
$x - 2y < -4$

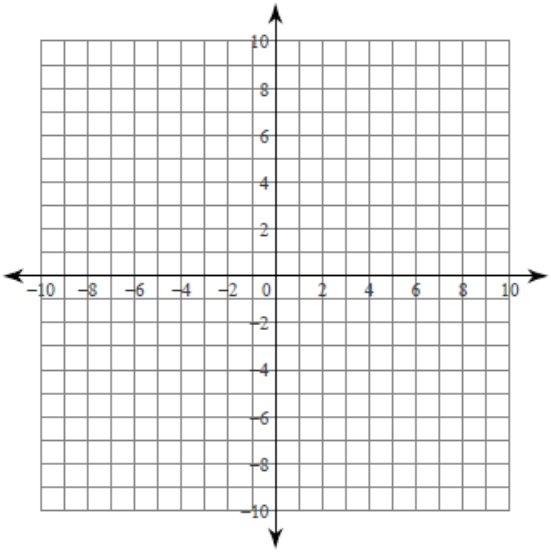


6) $5x + 3y > -9$
$x + 3y \leq 3$



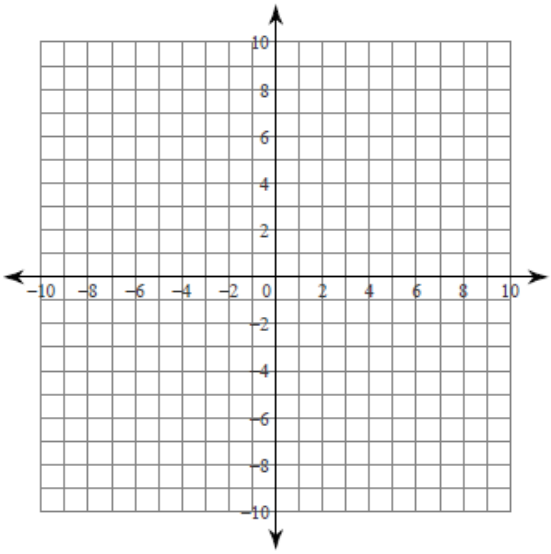
7) $y \leq -\frac{5}{4}x - 8$

$y < \frac{5}{4}x + 2$



8) $y \leq -\frac{8}{7}x + 7$

$y \geq -\frac{8}{7}x + 2$



9) Is (0, 7) a solution to question number 8 above?