Algebra 1B **Name** KEY

Chapter 7 Review: Linear Systems **Block** _____ **Date** _____

Calculator NOT Allowed

1. Is (2, 5) a solution of the following system? Explain.

$y = 2x + 1$

$2x - y = 8$

Plug in $x=2$ & $y=5$ to both...

$5 = 2(2) + 1$

$= 4 + 1$

$= 5$ ✓

$2(2) - (5) = 8$

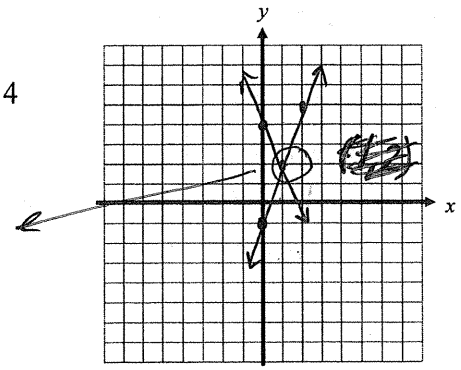
$4 - 5 \neq 8$ X

NO since (2,5) Didn't work for BOTH!

Solve each system by graphing.

2. $y = 3x - 1$

$y = -2x + 4$

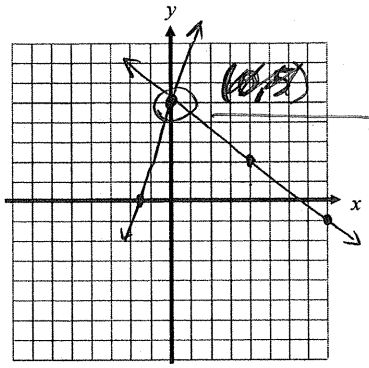


(1,2)

3. $y = -\frac{3}{4}x + 5$

$10x - 3y = -15$

x	y
0	5
-3/2 = -15/10	0

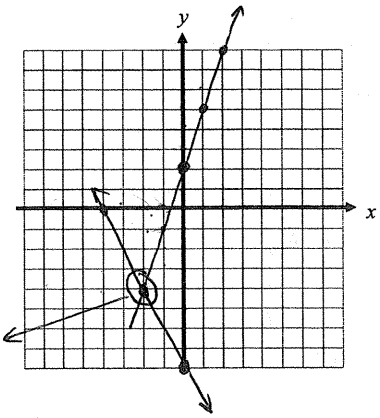


(0,5)

4. $y = 3x + 2$

$2x + y = -8$

x	y
0	-8
-4	0

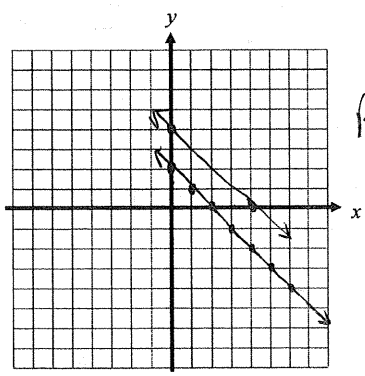


(-2,-4)

5. $y = -x + 2$

$3x + 3y = 12$

x	y
0	4
4	0

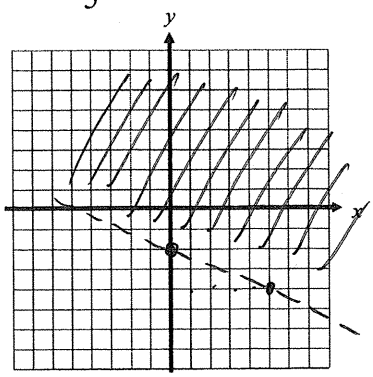


Parallel Lines

NO SOLUTION

Graph each inequality.

6. $y > -\frac{2}{5}x - 2$

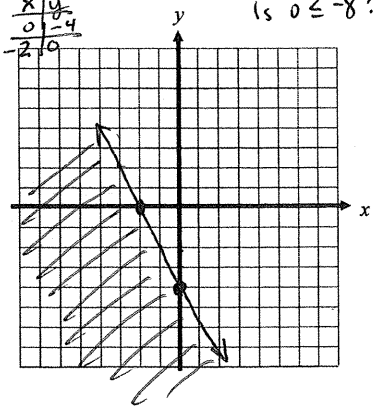


7. $4x + 2y \leq -8$

TEST (0,0)

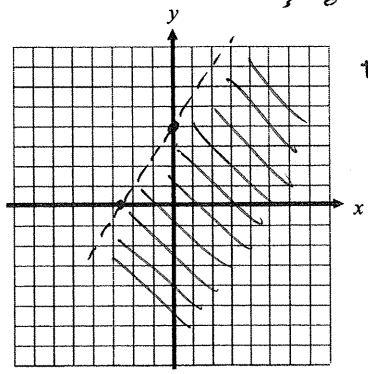
Is $0 \leq -8$? NO!

x	y
0	-4
-2	0



8. $6x - 4y > -16$

x	y
0	4
-8/3 = -16/6	0



TEST (0,0)

Is $0 > -16$? Yes

Graphing Calculator Allowed

Solve each system using substitution. ★★

9. $x = y - 7$
$2x + y = -8$

$2(y-7) + y = -8$
$2y - 14 + y = -8$
$3y - 14 = -8$
$3y = 6 \Rightarrow y = 2$

$x = 2 - 7 = -5$

(-5, 2)

10. $y = 3x - 10$
$y = 8x + 5$

$3x - 10 = 8x + 5$
$-15 = 5x$
$-3 = x$

$y = 3(-3) - 10 = -9 - 10 = -19$

(-3, -19)

11. $2x + 4y = -6$
$x - 3y = 7 \rightarrow x = 7 + 3y$

$2(7 + 3y) + 4y = -6$
$14 + 6y + 4y = -6$
$10y = -20$
$y = -2$

$x = 7 + 3(-2)$
$x = 7 - 6$
$x = 1$

(1, -2)

12. $4x + y = -2 \rightarrow y = -2 - 4x$
$-2x - 3y = 1$

$-2x - 3(-2 - 4x) = 1$
$-2x + 6 + 12x = 1$
$10x = -5$
$x = -1/2$

$y = -2 - 4(-1/2)$
$y = -2 + 2$
$y = 0$

(-1/2, 0)

Solve each system using elimination.

13. $x + 2y = 7$
$3x - 2y = -3$

$4x = 4$
$x = 1$

(1) $+2y = 7$
$2y = 6$
$y = 3$

(1, 3)

14. $9x - 3y = 24$
$-(7x - 3y = 20)$

$2x = 4$
$x = 2$

$9(2) - 3y = 24$
$18 - 3y = 24$
$-3y = 6$
$y = -2$

(2, -2)

15. $-6x + 12y = 96$
$2(3x - 6y = -48) \Rightarrow$

$-6x + 12y = 96$
$6x - 12y = -96$
$0 = 0$ TRUE!

∞ Solutions

16. $-3(4x - 3y = 11) \Rightarrow$
$4(3x - 5y = -11)$

$-12x + 9y = -33$
$12x - 20y = -44$
$-11y = -77$
$y = 7$

$4x - 3(7) = 11$
$4x - 21 = 11$
$4x = 32$
$x = 8$

(8, 7)

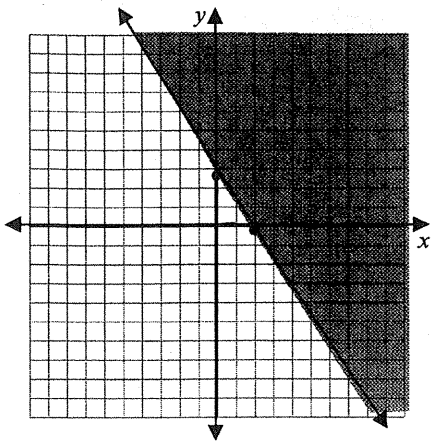
Solve each system by graphing using your graphing calculator. ** … not required in this chapter ***

17. $y = x - 5$
$y = 2x + 1$

Press Y= ... (as long as the equation is solved for y)
Enter first equation as Y1 and second equation as Y2
2nd TRACE (Calc) ... 5 ... Enter, Enter, Enter

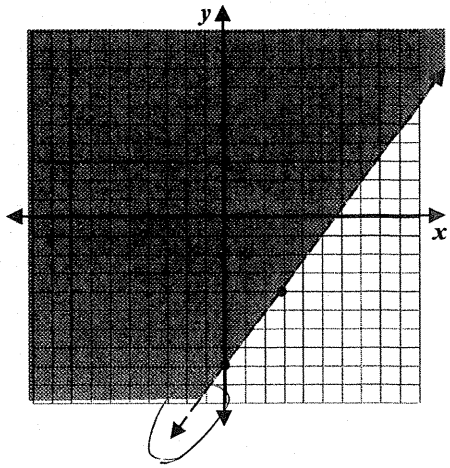
18. $x + y = -10$
$2x + 3y = -30$

Write the linear inequality shown on the graph.

19. 

y-intercept = 3
slope = $-3/2$
SHADED ABOVE & SOLID LINE

$y \geq -\frac{3}{2}x + 3$

20. 

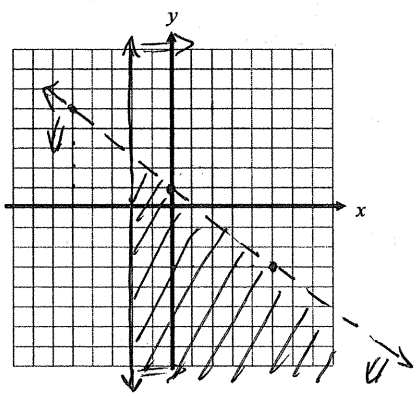
y-int: -8
Slope = $\frac{4}{3}$
Dashed Line
SHADED ABOVE

$y > \frac{4}{3}x - 8$

Graph each system of inequalities.

21. $x \geq -2$

$y < -\frac{4}{5}x + 1$

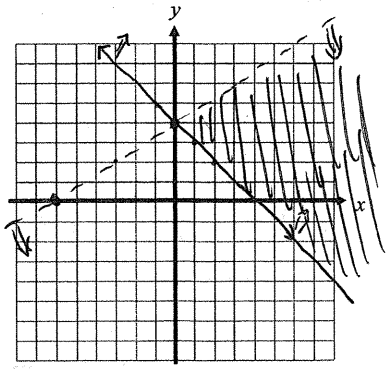


22. $-2x + 3y < 12$

$y \geq -x + 4$

x	y
0	4
-6	0

TEST (0,0) is $0 < 12$? ✓



Use a system of equations to solve each word problem.

23. Suppose your community center sells a total of 292 tickets for a basketball game. An adult ticket costs \$3. A student ticket costs \$1. The sponsors collect \$470 in ticket sales. Write and solve a system of linear equations to find the number of each type of ticket sold.

a = # of adult tickets
K = # of student tickets

$a + K = 292$
$3a + 1K = 470$

Solve by elimination... (subtract)

$-2a = -178$

$a = 89$

89 adult tickets
203 student tickets

24. Suppose you bought supplies for a party. Three rolls of streamers and 15 party hats cost \$30. Later, you bought 2 rolls of streamers and 4 party hats for \$11. Write and solve a system of linear equations to find the cost of each roll of streamers and each party hat.

r = cost of a roll of streamers
h = cost of a party hat

$3r + 15h = 30$ $\quad \cdot -2$
$2r + 4h = 11$ $\quad \cdot 3$

Solve by elimination

$\Rightarrow \quad -6r - 30h = -60$
$\quad 6r + 12h = 33$

$-18h = -27$

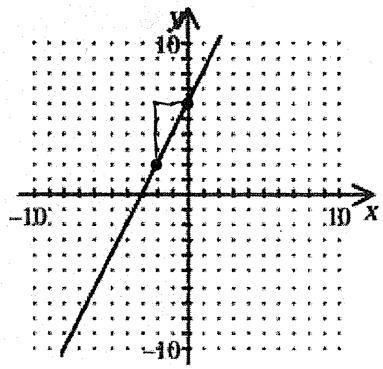
$h = 1.5$

$2r + 4(1.5) = 11$
$2r + 6 = 11$
$2r = 5$
$r = 5/2$

\$1.50 for a party hat
\$2.50 for a roll of streamers

Previous Chapter Review

25. Find the slope of the line.



Rise = 4

Run = 2

Slope = $\frac{4}{2}$

26. Suppose the following two points are on a line: $(-4, 10)$ and $(6, 5)$

a) Find the slope $\frac{y_2 - y_1}{x_2 - x_1} = \frac{10 - 5}{-4 - 6} = \frac{5}{-10} = \boxed{-\frac{1}{2}}$

b) Write the equation of the line in point-slope form.

$(-4, 10)$: $\boxed{y - 10 = -\frac{1}{2}(x + 4)}$ OR $(6, 5)$: $\boxed{y - 5 = -\frac{1}{2}(x - 6)}$

c) Write the equation of the line in slope-intercept form.

$y - 10 = -\frac{1}{2}x - 2$

$\boxed{y = -\frac{1}{2}x + 8}$ ← SAME ANSWER! → $y - 5 = -\frac{1}{2}x + 3$

$\boxed{y = -\frac{1}{2}x + 8}$

d) Write the equation of the line in standard form.

$\left[y = -\frac{1}{2}x + 8\right] 2$

$2y = -1x + 16$

$\boxed{x + 2y = 16}$