

Chapter 5 Exam Review

Algebra 1B

Solve each system using the method of your choice.

1) $\begin{cases} y = 2x - 3 \\ y = x + 1 \end{cases}$ Subs/elim.

$$\begin{array}{r} x + 1 = 2x - 3 \\ -x \quad \quad -x \\ \hline 1 = 1x - 3 \\ +3 \quad \quad +3 \\ \hline 4 = x \end{array}$$

$y = 4 + 1$
 $y = 5$

$(4, 5)$

2) $\begin{cases} y = 4x - 5 \\ y = x - 5 \end{cases}$

$$\begin{array}{r} x - 5 = 4x - 5 \\ -x \quad \quad -x \\ \hline -5 = 3x - 5 \\ +5 \quad \quad +5 \\ \hline 0 = 3x \\ \frac{0}{3} = \frac{3x}{3} \\ 0 = x \end{array}$$

$y = 0 - 5$
 $y = -5$

$(0, -5)$

3) $\begin{cases} 2x + 3y = -10 \\ x - y = 5 \\ 3x - 3y = 15 \end{cases}$

$$\begin{array}{r} x - y = 5 \\ -1 \quad \quad -1 \\ \hline -y = 4 \\ \frac{-y}{-1} = \frac{4}{-1} \\ -y = -4 \\ y = -4 \end{array}$$

$x = 1$

$(1, -4)$

4) $\begin{cases} 6x - 2y = 8 \\ 3x - y = 4 \\ 6x + 2y = -8 \end{cases}$

$$\begin{array}{r} 6x - 2y = 8 \\ 3x - y = 4 \\ -6x + 2y = -8 \\ \hline 0 = 0 \end{array} \rightarrow \text{I.M.S.}$$

5) $\begin{cases} 2x - 3y + z = -2 \\ y = x - 1 \\ z = -3x + 3 \end{cases}$

$$\begin{array}{r} 2x - 3(x - 1) + (-3x + 3) = -2 \\ 2x - 3x + 3 - 3x + 3 = -2 \\ -4x + 6 = -2 \\ -4x = -8 \\ -4x = -8 \\ \frac{-4x}{-4} = \frac{-8}{-4} \\ x = 2 \end{array}$$

$y = 2 - 1 \rightarrow y = 1$
 $z = -3 \cdot 1 + 3 \rightarrow z = 0$

$(2, 1, 0)$

6) $\begin{cases} 2x - y + z = 6 \\ x = 4 + 2z \\ y = 3z - 2 \end{cases}$

$$\begin{array}{r} 2(4 + 2z) - (3z - 2) + z = 6 \\ 8 + 4z - 3z + 2 + z = 6 \\ 8 + 4z - 3z + 2 + z = 6 \\ 2z + 10 = 6 \\ -10 \quad -10 \\ \hline 2z = -4 \\ 2z = -4 \\ \frac{2z}{2} = \frac{-4}{2} \\ z = -2 \end{array}$$

$x = 4 + 2 \cdot -2$
 $x = 0$
 $y = 3 \cdot -2 - 2$
 $y = -8$

$(0, -8, -2)$

$$7) \begin{cases} y = 3x - 5 \\ 6x - 2y = 10 \end{cases}$$

$$\begin{aligned} 6x - 2(3x - 5) &= 10 \\ 6x - 6x + 10 &= 10 \\ 10 &= 10 \rightarrow \text{I.M.S.} \end{aligned}$$

$$8) \begin{cases} 2x + 5y = 9 \\ 4x + 16y = 12 \\ -4x - 10y = -18 \end{cases} \rightarrow \begin{aligned} 4x + 16y &= 12 \\ 4x - 10y &= -18 \\ \hline 26y &= 30 \\ y &= \frac{30}{26} = \frac{15}{13} \end{aligned}$$

$$\begin{aligned} 4x + 16 \cdot \frac{15}{13} &= 12 \\ 4x + \frac{240}{13} &= 12 \\ 4x &= 12 - \frac{240}{13} \\ 4x &= \frac{156 - 240}{13} \\ 4x &= \frac{-84}{13} \\ x &= \frac{-21}{13} \end{aligned}$$

$$\boxed{(7, -1)}$$

$$9) \begin{cases} x - 3y = 8 \\ -3x + 9y = 15 \end{cases}$$

$$\begin{aligned} x - 3y &= 8 \\ -3x + 9y &= 15 \\ \hline 0 &= 39 \end{aligned} \rightarrow \emptyset$$

10) For what value of n does the system $\begin{cases} 2x - 3y = -10 \\ 6x + ny = -30 \\ -6x + 9y = 30 \end{cases}$ have infinitely many solutions?

$$\begin{aligned} 6x + ny &= -30 \\ -6x + 9y &= 30 \\ \hline ny + 9y &= 0 \\ y(n + 9) &= 0 \end{aligned}$$

$$\boxed{n = -9}$$

11) For what value of n does the system $\begin{cases} x + 2y = 11 \\ -3x + ny = -8 \\ 3x + 6y = 33 \end{cases}$ have no solution?

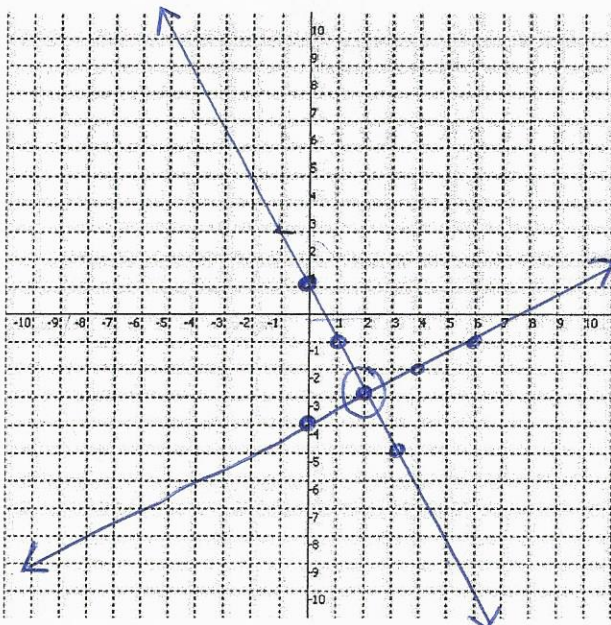
$$\begin{aligned} -3x + ny &= -8 \\ 3x + 6y &= 33 \\ \hline 0 &= 25 \end{aligned}$$

$$\boxed{n = -6}$$

12) Graph the system $\begin{cases} y = -2x + 1 \\ x - 2y = 8 \end{cases}$

$$\begin{aligned} x - 2y &= 8 \\ -x - 2y &= 8 \\ \hline -2y &= 16 \\ y &= -8 \end{aligned}$$

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

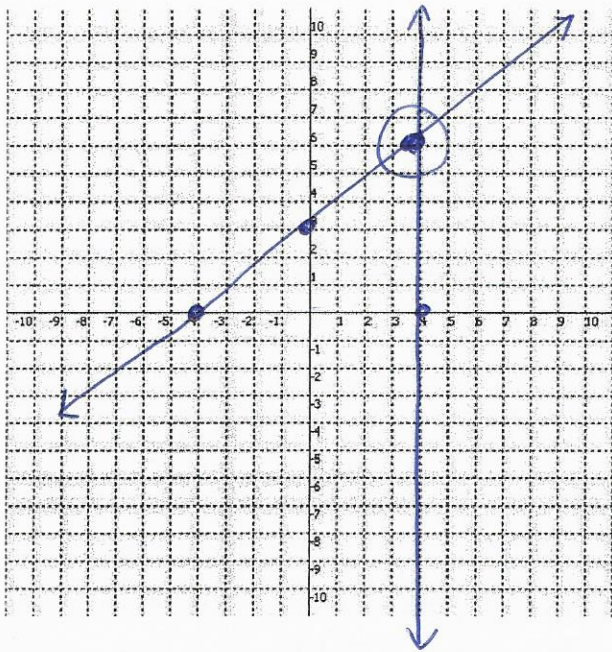


Use the graph to identify the solution to the system.

intersect @ $\boxed{(2, -3)}$

13) Graph the system $\begin{cases} -3x + 4y = 12 \\ x = 4 \end{cases}$ → Vert.

x int. @ -4
y int @ 3



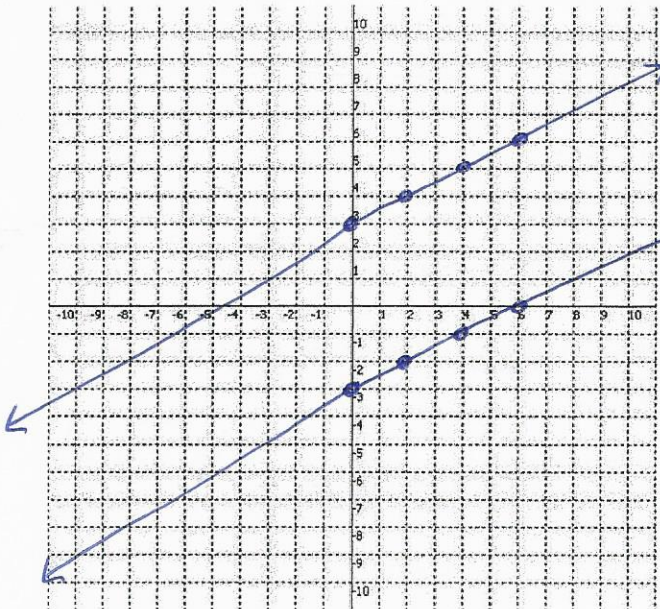
Use the graph to identify the solution to the system.

$(4, 6)$

14) Graph the system $\begin{cases} y = \frac{1}{2}x - 3 \\ 2x - 4y = -12 \end{cases}$

$$\begin{array}{r} 2x - 4y = -12 \\ -2x \end{array}$$

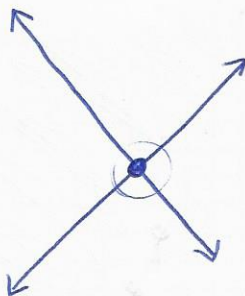
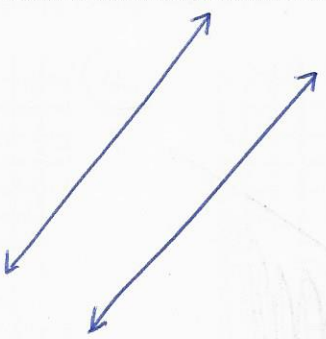

$$\frac{-4y}{-4} = \frac{-2x - 12}{-4} \rightarrow y = \frac{1}{2}x + 3$$



Use the graph to identify the solution to the system.

\emptyset

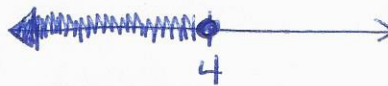
15) For each situation listed in the table, draw a possible sketch of a graph.

A system with ONE solution	A system with NO solutions	A system with INFINITELY MANY solutions
		
consistent	inconsistent	consistent (dependent)

*For each system above, tell whether it is *consistent* or *inconsistent*.
 Solution no sol.

16) Solve $2c - 3 \leq 5$. Graph the solution set on a number line.

$$\begin{aligned} 2c - 3 &\leq 5 \\ +3 &+3 \\ \hline 2c &\leq 8 \\ \frac{2c}{2} &\leq \frac{8}{2} \\ \boxed{c} &\leq \boxed{4} \end{aligned}$$

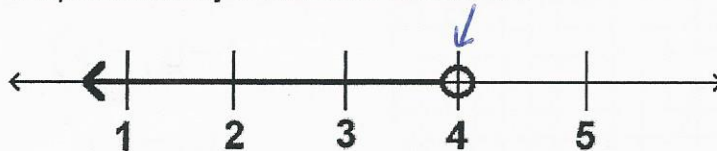


17) Solve $-3g + 6 > 9$. Graph the solution set on a number line.

$$\begin{aligned} -3g + 6 &> 9 \\ -6 &-6 \\ \hline -3g &> 3 \\ \rightarrow \frac{-3g}{-3} &> \frac{3}{-3} \\ \boxed{g} &< \boxed{-1} \end{aligned}$$



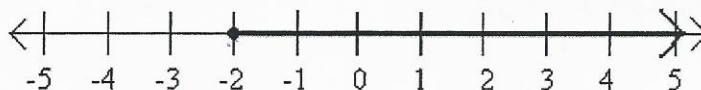
18) What inequality is represented by the number line below?



$$\boxed{x < 4}$$

19) What inequality is represented by the number line below?

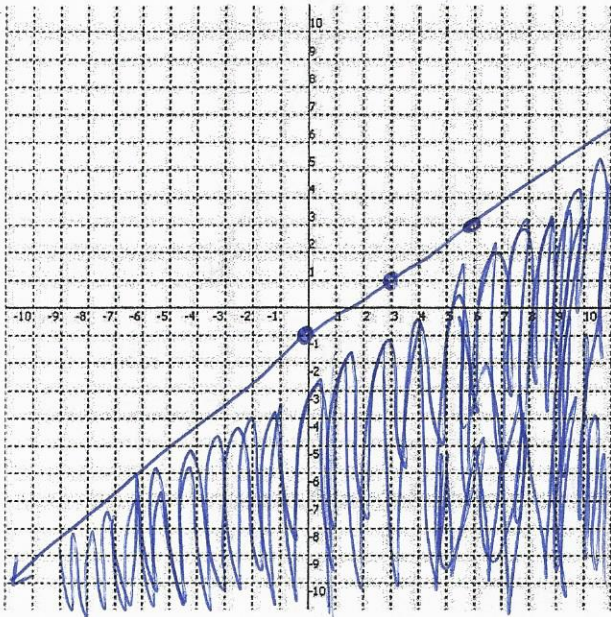
$$\boxed{x \geq -2}$$



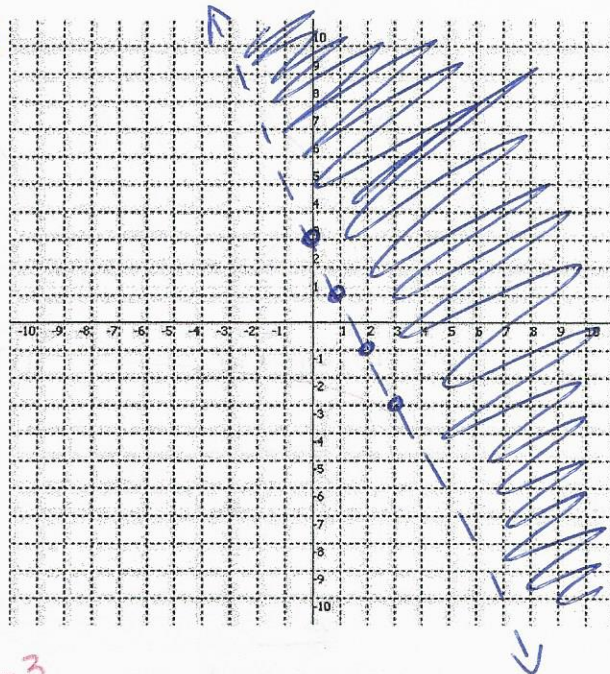
20) Graph the linear inequality $y \leq \frac{2}{3}x - 1$ on a coordinate plane.

21) Graph the linear inequality $y > -2x + 3$ on a coordinate plane.

20



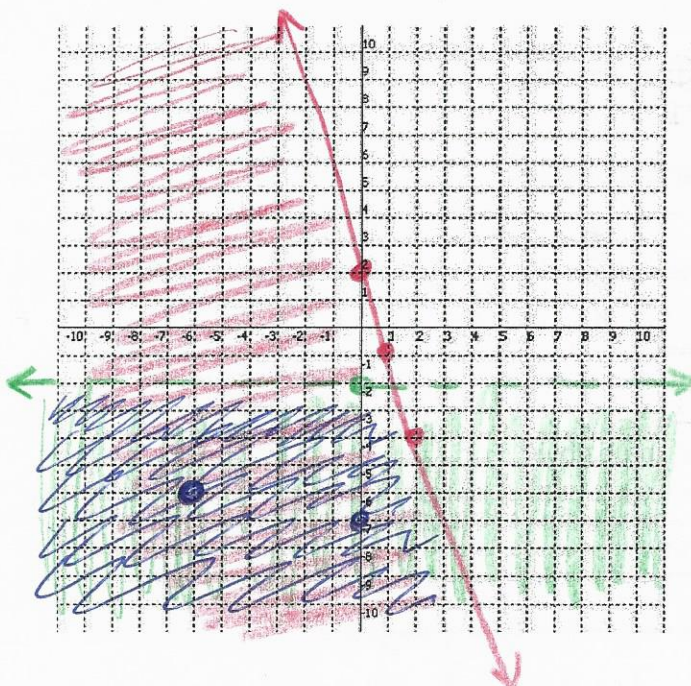
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22) Graph the system of linear inequalities:

$$\begin{cases} y \leq -3x + 2 \\ y < -2 \end{cases}$$

$\rightarrow -\frac{3}{1}$
 \rightarrow horiz.

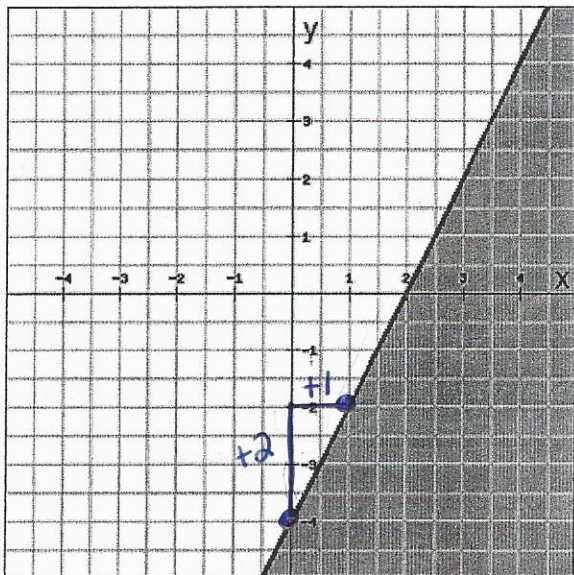


Identify TWO points that are solutions to this system.

$$(-6, -6)$$

$$(0, -7)$$

23) Write the linear inequality represented by the graph below.

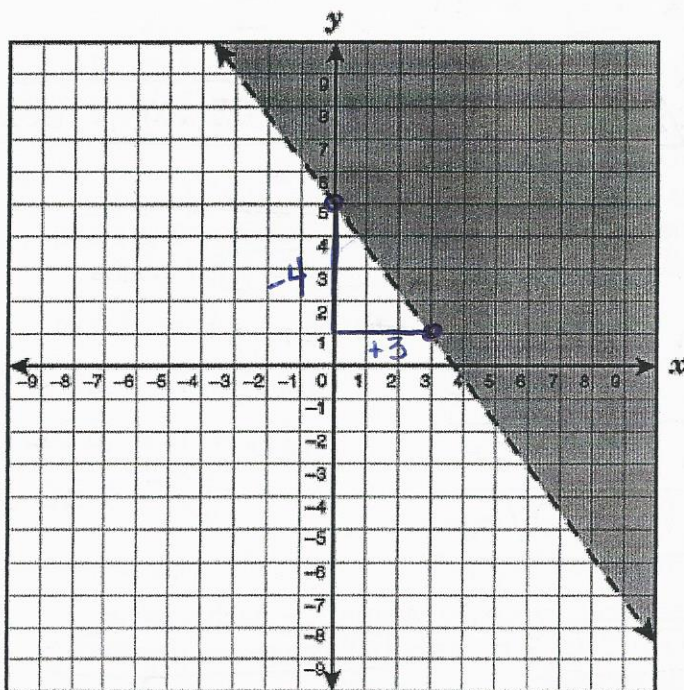


$$y = mx + b$$

$$y \leq 2/1 x - 4$$

$$y \leq 2x - 4$$

24) Write the linear inequality represented by the graph below.



$$y = mx + b$$

$$y > -4/3 x + 5$$

$$y > -4/3 x + 5$$

25) The sum of two numbers is 12. The first number is 6 more than the second number.

a. Define the variables in this situation.

$$X = \text{a \#}$$

$$y = \text{another \#}$$

b. Write a system of equations. (translate)

$$X + y = 12$$

$$X = 6 + y$$

c. Solve your system and find the two numbers.

$$6 + y + y = 12$$

$$\begin{array}{r} y + 2y = 12 \\ -y \quad -y \\ \hline 2y = 6 \end{array}$$

$$2y = 6 \rightarrow y = 3$$

$$X = 6 + y$$

$$X = 6 + 3$$

$$X = 9$$

26) For a fundraiser, Ali is selling small boxes of candy for \$2 and large boxes of candy for \$5. She sells 11 boxes of candy and earns a total of \$31. How many of each size did she sell?

$$X = \text{\# of small}$$

$$y = \text{\# of large}$$

$$(\$) 2x + 5y = 31$$

$$(\#) (x + y = 11)$$

$$x + 3 = 11$$

$$x = 8 \text{ small boxes}$$

$$\begin{array}{r} -2x - 2y = -22 \\ 2x + 5y = 31 \\ \hline 3y = 9 \end{array}$$

$$2x + 5y = 31$$

$$3y = 9$$

$$y = 3 \text{ large boxes}$$

27) Jeannette hires an electrician to rewire her kitchen. He charges an hourly rate plus a flat-rate service fee. Jeannette spoke to two friends who hired the same electrician. One friend paid \$236 for a three-hour job, and another friend paid \$360 for a five hour job. Find the hourly rate and the service fee.

$$h = \text{hourly rate}$$

$$f = \text{fee (flat)}$$

$$-3h + f = -236 \rightarrow 3h + f = 236$$

$$5h + f = 360$$

$$3 \cdot 62 + f = 236$$

$$2h = 124$$

$$186 + f = 236$$

$$h = \$62/\text{hr.}$$

$$f = \$50 \text{ service fee}$$

28) Carson joins a gym where he pays a flat membership fee and a small fee each time he visits. If he visits 10 times this year, he will pay \$105. If he visits 18 times he will pay \$129. At this rate, how much will he pay if he visits 26 times?

$$m = \text{membership fee}$$

$$v = \text{cost/visit}$$

$$-10v + m = 105$$

$$18v + m = 129$$

$$8v = 24$$

$$v = \$3/\text{visit}$$

$$10v + m = 105$$

$$10 \cdot 3 + m = 105$$

$$30 + m = 105$$

$$m = \$75$$

$$\text{mem. fee}$$

$$26v + m$$

$$26 \cdot 3 + 75 = \$153$$