

Name: _____

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Algebra 1 Unit 2 Test Review: Reasoning with Linear Equations and Inequalities

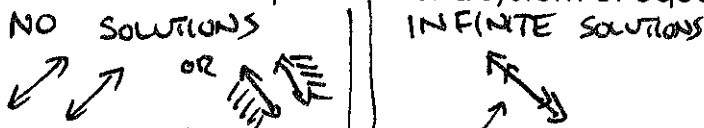
1. What does it mean if a coordinate pair (x,y) is a solution to a system of linear equations or inequalities?

IT MEANS THAT (x,y) WORK FOR BOTH EQUATIONS/INEQUALITIES

2. Once a system of equations is graphed, how do you know what the solution is?

THE POINT WHERE THEY INTERSECT

3. What special solutions are possible for a system of equations or inequalities?



4. Solve for w. $z = x + \left(\frac{1}{3}\right)yw$

3. $z - x = \left(\frac{1}{3}\right)yw$ $\cdot 3$ TWO OF THE SAME LINES

- SUBTRACT X
- MULTIPLY BY 3
- DIVIDE BY Y

5. Solve for w. $yv = \frac{w-x}{y} \cdot y$

$yv = w - x$

$yv + x = w$

- MULTIPLY BY Y
- ADD X

6. Solve for w. $v = \frac{xy}{xy} \cdot w$

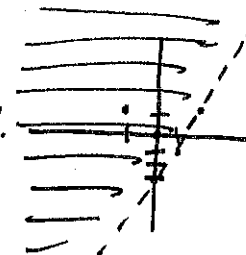
$vxy = w$

MULTIPLY BY xy

7. Graph the inequality $y > 2x - 3$

8. Name two solutions to the inequality graphed in number 7.

$(0, 0)$ $(-1, 1)$



9. Write an inequality to represent each of the following scenarios:

- a. There are no more than 12 students. $x \leq 12$
- b. There is a minimum of 12 students. $x > 12$
- c. There are at least 12 students. $x > 12$
- d. There are at most 12 students. $x < 12$
- e. There is a maximum of 12 students. $x < 12$

10. Solve $\frac{5(2x-3)}{5} < \frac{20}{5}$ $2x-3 < 4$ $2x < 7$ $x < \frac{7}{2}$

11. Identify the property of equality used to justify each step taken when solving the equation $2x - 6 = 18$

- a. Step 1: ADD PROPERTY
- b. Step 2: SUBSTITUTION
- c. Step 3: DIVISION
- d. Step 4: SUBSTITUTION

$2x - 6 = 24$
Step 1: $2x - 6 + 6 = 24 + 6$
Step 2: $2x = 30$
Step 3: $\frac{2x}{2} = \frac{30}{2}$
Step 4: $x = 15$

12. The Sprayberry Football concession stand sold hamburgers for \$1.50 and sodas for \$1.00 at the last football game. If a total of 664 items were sold to give sales of \$770,

how many of each item was sold?

$x = \text{HAMBURGERS } (212)$

$y = \text{SODAS } (452)$

$$x + y = 664$$

$$1.50x + y = 770$$

$$-x - y = -664$$

$$1.50x + y = 770$$

$$\frac{.50x}{.50} = \frac{106}{.50}$$

$$x = 212$$

$$212 + y = 664$$

$$y = 452$$

13. Which region should be shaded to show the solution set of the system of inequalities below?

A. Region A

B. Region B

C. Region C

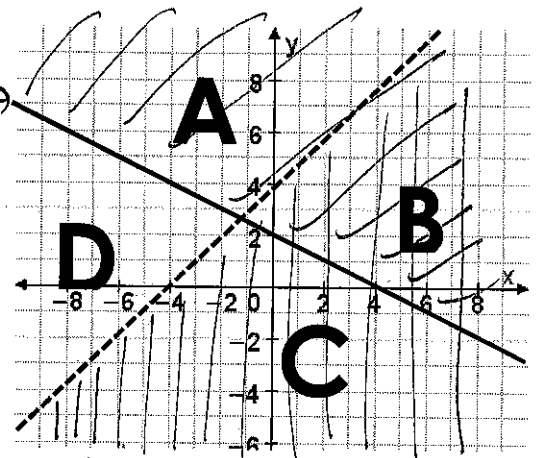
D. Region D

$$2y < 2x + 8$$

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

$$\frac{2y}{2} < \frac{2x + 8}{2}$$

$$y < x + 4$$



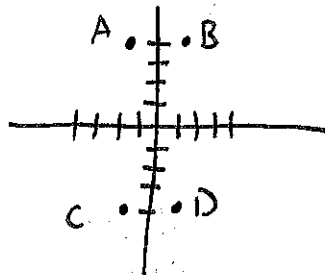
14. Sketch a graph and plot each of the following points:

A. (-1, 4)

B. (1, 4)

C. (-1, -4)

D. (1, -4)



15. $G(t)$ represents the number of gray hairs on Mrs. Williams's head in years since beginning teaching in ~~the~~ 2010 and can be modeled by the equation $G(t) = 25t$. Which of the following correctly models the number of gray hairs on Ms. Williams's head in 2015?

A. $G(2015) = 50, 375$

B. $G(2010) = 50, 250$

C. $G(5) = 125$

D. $G(\text{Mrs. Williams has no gray hair})$

16. Ashley orders 3 shirts and 4 pairs of pants from Old Navy and spends \$115.50. Brittany orders 2 shirts and 3 pairs of pants from Old Navy and spends \$83.50. How much does one shirt cost?
- $(3x + 4y = 115.50) \cdot 2$
 $(2x + 3y = 83.50) \cdot 3$
- $$\begin{array}{r} -6x - 8y = -231 \\ 6x + 9y = 250.5 \\ \hline y = 19.5 \end{array}$$
- $3x + 4(19.50) = 115.50$
 $3x + 78 = 115.50$
 $3x = 37.50$
 $x = 12.50$
- $x = \text{SHIRTS } \$12.50$
 $y = \text{PANTS } \$19.50$

17. Jen is saving money to go on a huge vacation. She currently has \$2000 in savings and adds \$50 a month to her savings account. Her savings can be modeled by the equation $f(x) = 2000 + 50x$.

- What does the slope represent? 50; \$50 SAVING PER MONTH
- What does the y-intercept represent? 2000. HER INITIAL AMOUNT
- What does the independent (x-variable) represent? x; EACH MONTH
- What does the dependent (f(x) variable) represent? f(x); TOTAL MONEY AFTER x MONTHS

18. How many solutions would each of the following the following equations and inequalities have?

- A. $x + 2 = 4 + x - 2$ $x + 2 = x + 2$ $2 = 2$ INFINITE! $2 \text{ ALWAYS} = 2 \text{ SO}$
- B. $x + 2 = x + 4$ $2 = 4$ NO SOLUTIONS $2 \text{ NEVER} = 4$
- C. $x + 2 > x + 4$ $2 > 4$ NO SOLUTIONS $2 \text{ IS NEVER GREATER THAN } 4$
- D. $x + 2 < x + 4$ $2 < 4$ INFINITE! $2 \text{ IS ALWAYS LESS THAN } 4$

19. Rearrange the following equation into slope intercept form $3x + 9y = x - 18$

$$y = \frac{-2}{9}x - 2$$

$$\begin{array}{r} -3x \quad -3x \\ 9y = -2x - 18 \\ \hline y = \frac{-2x - 18}{9} \end{array}$$

Solve the following:

20. Solve for x: $\frac{5(2x-1)}{5} = \frac{20}{5}$

$$\begin{array}{r} 10x - 5 = 20 \\ +5 \quad +5 \end{array}$$

$$\frac{10x}{10} = \frac{25}{10}$$

$$x = 2.5$$

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

$$\frac{2x}{2} = \frac{5}{2}$$

$$x = \frac{5}{2} = 2.5$$

19. Solve for x: $7(x-2) + 3 = -2(x+3) - 7$

$$\begin{array}{r} 7x - 14 + 3 = -2x - 6 - 7 \end{array}$$

$$\begin{array}{r} 7x - 11 = -2x - 13 \\ +2x \quad +2x \end{array}$$

$$9x - 11 = -13$$

$$\begin{array}{r} 9x - 11 = -13 \\ +11 \quad +11 \end{array}$$

$$\frac{9x}{9} = \frac{-2}{9}$$

$$x = -2/9$$

21. Solve the following system by graphing and elimination.

$$2y - 4x = 10$$

$$y - 5 = -2x$$

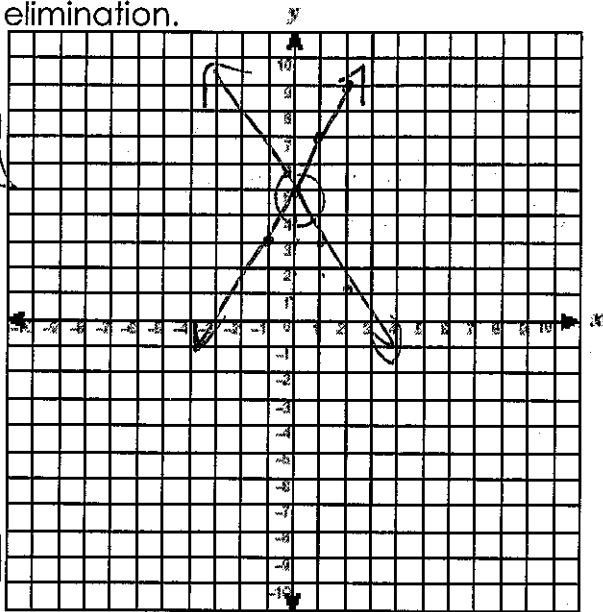
$$y = 2x + 5$$

$$2y - 4x = 10$$

$$2y = 4x + 10$$

$$y = 2x + 5$$

(0, 5)



$$y - 5 = -2x$$

$$y + 2x - 5 = 0$$

$$y + 2x = 5$$

$$2y - 4x = 10$$

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

$$2y - 4x = 10$$

$$2y + 4x = 10$$

$$4y = 20$$

$$y = 5$$

$$5 + 2x = 5$$

$$-5 - 5$$

$$2x = 0$$

$$x = 0$$

22. If $d = \frac{1}{2}at^2$ where a is measured in meters per second squared and t is measured in seconds,

a. What units is d measured in?

METERS

$$d = \frac{1}{2} \left(\frac{m}{s^2} \right) (s^2)$$

$$\frac{m}{s^2} \cdot s^2 = m$$

b. Solve for a .
 • MULTIPLY BY 2
 • DIVIDE BY t^2

$$2 \left(d = \frac{1}{2}at^2 \right)^2$$

$$\frac{2d}{t^2} = \frac{at^2}{t^2}$$

$$\frac{2d}{t^2} = a$$

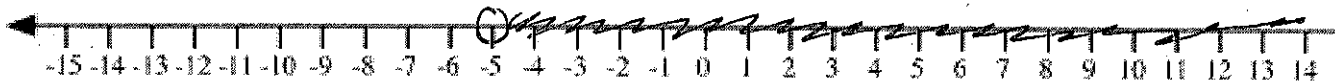
23. Brittany received a \$1500 tax return. Since then, she has saved an additional \$200 per month. She has been saving for six months. She hopes to save enough to pay for her children's daycare for two months, so she needs \$3000. Does she currently have enough money in savings?

$$1500 + 200x \geq 3000$$

$$1500 + 200(6) = 2700$$

SO SHE DOES NOT HAVE ENOUGH MONEY. SHE NEEDS TO SAVE FOR 2 MORE MONTHS

24. a. Solve the inequality. Graph the solution. $-2x + 3 < 13$



$$-2x + 3 < 13$$

$$-3 - 3$$

$$-2x < 10$$

$$\frac{-2x}{-2} < \frac{10}{-2}$$

$$x > -5$$

REMEMBER THE SIGN FLIPS