

Algebra Review Packet Semester 1

Name _____

Show all work done for each problem, like on the semester exam. Your semester exam is _____
Write each algebraic expression in words.

1. $2 + x$
the sum of a # 4 2

2. $\frac{r}{3}$ the quotient of
q # 4 3

3. $6(y-1)$

the product of 6 &
less than a #

Evaluate if $a = -1, b = 2, c = -2$

4. $-4ac$
 $-4 \cdot 2$

5. $a(b-c)$
 $-1(2+2)$

6. $\frac{3a-b}{-c-2}$
 $\frac{-5}{2}$

7. $-3b^2 + 1$
 $-3 \cdot 4 + 1$

8. $(a+b)(c-b)$
 $(-1+2)(-2-2)$

-8

-11

-4

Simplify

9. $-6 - 8 + 3$

10. $\frac{-24}{-6}$

11. $2y - 3(y + 2)$

12. $24 - 3 + 15 + (-4)^2$

-11

4

$-y-6$

52

13. $-3x^2 - 6(-2 - x^2)$
 $-3x^2 + 12 + 6x^2$

14. $\sqrt{25} + 4 \div -2$
 $5 + -2$

15. $3 - 6 \cdot -1$

16. $-10 + 4 \div -2^2$
 $-10 + 4 \div -4$

$3x^2 + 12$

9

-11

Solve.

17. $\frac{-30 = 6g}{6}$

18. $3 - x = -10$
 -3
 $-x = -13$

19. $3c + 4 = -17$
 -4
 $3c = -21$
 3

-5

13

-7

20. $6 + 2(y-1) = y + 1 + y$
 $6 + 2y - 2 = 2y + 1$

21. $\frac{g+2}{-2} = \frac{g}{4}$

22. Solve for y: $-2x + 4y = 5$
 $4y = 5 + 2x$
 $\frac{4y}{4} = \frac{5+2x}{4}$

\emptyset

$\frac{-4}{3}$

$y = \frac{1}{4}x + \frac{5}{4}$

23. What is 22% of 30?
 $.22(30) = x$

24. 7 is what % of 40?
 $\frac{x}{100} = \frac{7}{40}$
 $\frac{40x = 700}{40 \quad 40}$

25. 6 is 40% of what?
 $\frac{6}{x} = \frac{40}{100}$
 $40x = 600$

6.6

17.5%

15

26. Bob biked 40 miles in 2 hours and 8 minutes. Find his unit rate to the nearest tenth. Label units.

$\frac{40 \text{ miles}}{128 \text{ min}} = \frac{3125 \text{ mi}}{\text{min}}$
 $\frac{128 \text{ min}}{40 \text{ mi}} \cdot \frac{64}{20} = \frac{3.2 \text{ min}}{\text{mi}}$

27. Estimate (without a calculator) a 20% tip on a bill of \$32.92.

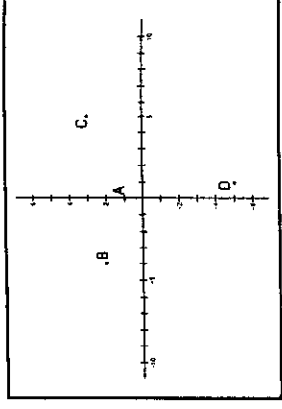
33.00

$10\% \text{ is } 3.30, 20\% \text{ is } 6.60$

28. Sue bought a hat which was marked up 35% from \$15. What price did she pay?
 135% of $15 = \$20.25$

29. A pair of \$300 ski boots goes on sale for \$199. Find the percent discount (decrease).

$$\frac{101}{300} = .337 \quad 33.7\%$$



30. Name the coordinates of each point, as well as the quadrant it lies in.

A (0,1) - B (-4,2) II C (5,3) I D (1,5) IV

Generate ordered pairs for each function, for the given values of x : $x = -2, -1, 0, 1$

31. $y = 2x + 1$

x	-2	-1	0	1
y	-3	-1	1	3

32. $y = 3|x|$

x	-2	-1	0	1
y	6	3	0	3

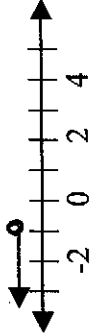
33. $y = 2x^2 + 1$

x	-2	-1	0	1
y	9	3	1	3

34. Write the inequality in words: A. $y \leq -4$
 All #'s less than or = to -4

B. $3 < x$
 All #'s greater than 3

35. Write the inequality shown by the graph:

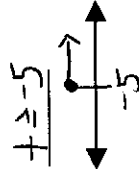


$y < -1$

Solve and graph each inequality.

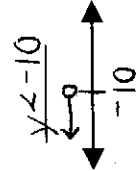
36. $-3 \leq t + 2$

$$\begin{aligned} -2 & \leq t \\ -5 & \leq t \end{aligned}$$



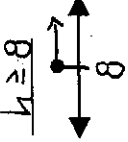
37. $\frac{y}{-2} > 5$

$$y < -10$$



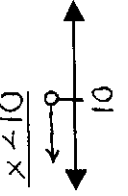
38. $\frac{4-2h}{2} \leq -6$

$$\begin{aligned} 4-2h & \leq -12 \\ -2h & \leq -16 \\ h & \geq 8 \end{aligned}$$



39. $-3(x-1) > -3^3$

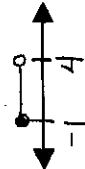
$$\begin{aligned} -3x+3 & > -27 \\ -3x & > -30 \\ x & < 10 \end{aligned}$$



40. $-3 \leq 2x - 1 < 7$

$$\begin{aligned} +1 & \quad +1 \quad +1 \\ -2 \leq 2x & < 8 \\ \frac{-2}{2} \leq \frac{2x}{2} & < \frac{8}{2} \end{aligned}$$

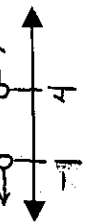
$$-1 \leq x < 4$$



41. $\frac{2g}{2} < -2$ or $\frac{3g}{3} \geq 12$

$$g < -1 \text{ or } g > 4$$

$$g < -1 \text{ or } g > 4$$



43. $|2x + 1| = 9$

$$\begin{aligned} 2x+1 & = 9 \text{ or } 2x+1 = -9 \\ \frac{-1}{2} & \quad \frac{-1}{2} \\ 2x & = 8 \quad 2x = -10 \end{aligned}$$

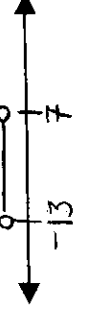
$$x = 4 \text{ or } x = -5$$



45. $-2|x + 3| > -20$

$$\begin{aligned} |x+3| & < 10 \\ -10 & < x+3 < 10 \end{aligned}$$

$$-13 < x < 7$$



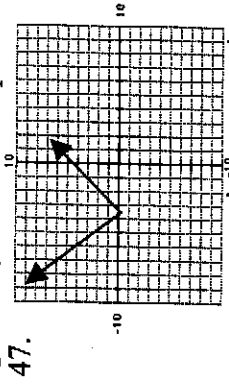
00-8
 4126
 8243

Determine if the following relations represent functions. Explain.

46.

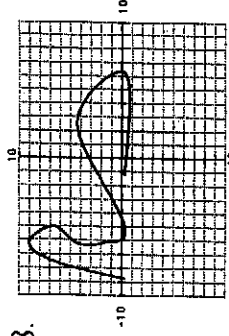
x	-2	0	1	3
y	3	-4	-4	3

Yes, each x is assigned to one y



Yes, it passes the vertical line test

48.



No, it fails the V.L. Test

49. Write an equation to represent the function: $\{(2, -4), (3, -6), (4, -8), (5, -10)\}$ $F(x) = -2x$

What is the domain? \mathbb{R} What is the range? \mathbb{R}

50. If $f(x) = 4x^2 - 5$, find $f(0) = -5$, $f(-1) = -1$, and $f(2) = 11$

51. To join a service club, membership costs \$100 for a one-time fee, plus \$5 per week.

A. Write a function to describe this situation, and define variables: $m(x) = 100 + 5x$

$x = \text{\#weeks}$

$m = \text{membership fees}$

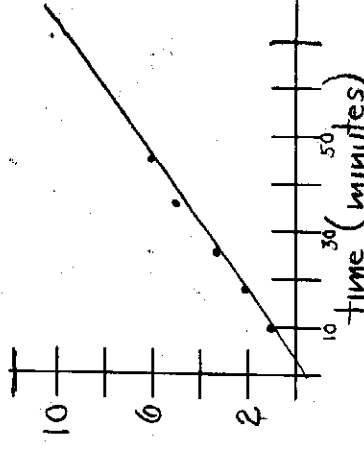
B. What is your independent variable? x What is your dependent variable? m

C. If Lori joins the club, how much will she have paid after 6 weeks? $m(6) = 100 + 5 \cdot 6 = 130$

52. Ben can fix flat tires quickly, and as he works more, he gets faster. The table shows how long it takes him to fix a certain number of bikes.

# of tires	1	2	3	5	6
minutes	10	18	26	38	45

A. Make a scatterplot of the data and draw a trend line. Label axes



B. Describe the correlation. positive

C. Predict how long it will take Ben to fix 10 tires. ~ 70 min

Solve.

$$53. \frac{2}{3}d = -20 \cdot \frac{3}{2}$$

$$d = -30$$

-30

$$54. \left(\frac{x}{3} - 1 = \frac{9}{4}\right)$$

$$4x - 12 = 27$$

$$\frac{4x}{4} = \frac{39}{4}$$

$$x = \frac{39}{4}$$

$$55. (0.15x + 0.2 = 0.05x)$$

$$15x + 20 = 5x$$

$$-15x$$

$$\frac{20 = -10x}{-10 \quad -10}$$

$$x = -2$$

56. Joe needs to buy bags of chips for a party. He has \$20 to spend, and each bag of spicy chips costs \$2.50. Write an inequality to represent this situation, and then solve it.

$$2.5x \leq 20 \quad x \leq 8 \quad x = 0, 1, 2, 3, 4, 5, 6, 7, 8$$

57. The price for a sweater will cost between \$25 and \$40. Write a compound inequality to represent the cost of the sweater.

$$25 \leq c \leq 40 \quad c = \text{cost}$$

58. What must be true for a function to be linear? Give an example of data points which would represent a linear function.

x	-1	0	1	2
y	2	5	8	11

The change in y is constant
change in x

Determine if each function is linear. Yes or no?

59. A horizontal line yes 45. A vertical line no 46. A parabola no 47. $y = 10a^2b$ no

Fill in the blank:

60. The slope formula is $\frac{y_2 - y_1}{x_2 - x_1}$

61. The slope-intercept equation of a line is: $y = mx + b$

62. A vertical line has undefined slope, and a horizontal line has zero slope.

63. In $y = -3x$, the slope is -3 and the y-intercept is 0

64. An example of an equation for a vertical line is $x = 2$, and a horizontal line is $y = -1$.

Matching: Match each definition with the correct vocabulary word.

65. I Whole numbers and their opposites

66. F A number multiplied by a variable.

67. A $Ax + By = C$

68. G A letter which represents a number

69. B The vertical axis

70. E The value where a line crosses the x-axis.

A. standard form of a line.

B. y-axis

C. x-axis

D. x-intercept

E. y-intercept

F. coefficient

G. variable

I. integers

Short answer:

71. How do you know if an (x,y) point is a solution to a function?

It

72. When graphing a function, how do you know if you just graph points (discrete), or if you connect the points (continuous)? If the domain is a discrete set of points, it's discrete;

if the domain is continuous, the graph is continuous

73. If you solve an equation, how can you check your answer?

Put the value of the variable into the equation to see if it's true

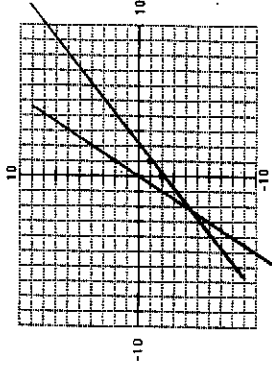
74. What is true about the slopes of parallel lines? perpendicular lines?

75. If a point is a solution to a system of equations, where will it be on a graph of the equations?

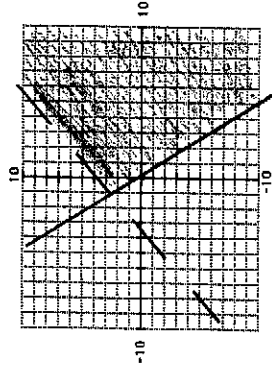
Solve each system graphically.

94. $\begin{cases} y+2=x \\ 2x=y \end{cases}$

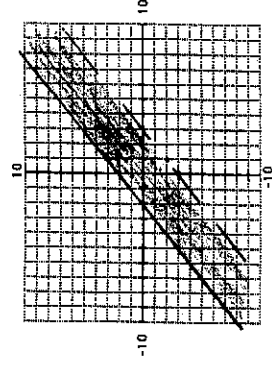
$(-2, -4)$



95. $\begin{cases} y < x+4 \\ y \geq -2x \end{cases}$



96. $\begin{cases} y > x-3 \\ y-2 \leq x \end{cases}$



Set up a system of equations and then solve.

97. Mike has 40 coins which are only dimes and quarters. If he has \$5.20, then how many dimes does he have?

$d = \# \text{ dimes}$
 $q = \# \text{ quarters}$

$\begin{cases} d+q=40 \\ 10d+25q=520 \\ -10d-10q=-400 \\ 15q=120 \end{cases}$

$\begin{cases} q=8 \\ d=32 \end{cases}$

98. At a high school basketball game, tickets are \$7.00 for each adult, and \$4.00 for each student. If 320 tickets were sold totaling \$1610, then how many of each type of ticket were sold.

$x = \# \text{ adult tickets}$
 $y = \# \text{ student tickets}$

$\begin{cases} x+y=320 \\ 7x+4y=1610 \\ -7x-7y=-2240 \end{cases}$

$\begin{cases} -3y=7630 \\ -3 \\ y=210 \\ x=110 \end{cases}$

99. Y varies directly as x, and y = 10 when x = -5. Find y if x = -3

$\frac{10}{-5} = \frac{k \cdot -5}{-5} \quad k = -2$
 $y = -2x$
 $x = 0$

100. A student's grade varies directly with the time spent on homework. If a student spends 150 minutes each week and has a 90%, find how much time he would have to spend to get a 70%?

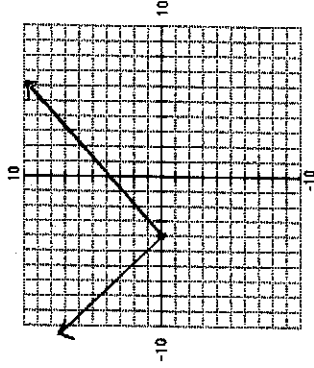
$g = k \cdot h$
 $\frac{90}{150} = \frac{k \cdot 150}{150}$
 $k = \frac{3}{5}$

$h = 70 \cdot \frac{5}{3} = \frac{350}{3} = 116.\bar{6} \text{ min.}$
 $= 117 \text{ min.}$

Graph each absolute value function and find the A) axis of symmetry B) Vertex C) Domain D) Range

101. $y = |x+4|$

- A $x = -4$
- B $(-4, 0)$
- C \mathbb{R}
- D $y \geq 0$



102. $y = |3x| + 2$

- A $x = 0$
- B $(0, 2)$
- C \mathbb{R}
- D $y \geq 2$

