

Algebra I - First Semester Final Review

Change the following statements into an algebraic expression.

1. A number increased by 8.
2. Twice a number decreased by 2.
3. 5 less than the square of a number.

Evaluate the following using the correct order of operations.

4. $6 - 2 \cdot 12$
5. $3 + 4(2 - 6)$
6. $5 - 12 \cdot 3 \div 2$
7. $-20 \div 5 + 4 \cdot 2$

Simplify the following expressions.

8. $4a + 5a + 2a$
9. $6x + 3 + 7x - 10$
10. $3(x + 2)$
11. $3(x + 2) + 4(3 + 6x)$

Select the property that best fits the description.

12. The statement "If $x + 3 = 8$ and $x = 5$, then $5 + 3 = 8$ " represents what property of real numbers?
13. The statement $2(x + 3) = 2x + 6$ represents what property of real numbers?

- | | |
|---|-------------------------------------|
| A. Associative property of Multiplication | E. Symmetric Property |
| B. Commutative Property of Multiplication | F. Substitution Property |
| C. Distributive Property | G. Addition Property of Equality |
| D. Multiplicative Identity | H. Associative Property of Addition |

Solve the following equations.

14. $2x + 3 = -17$
15. $8 - 2x = -10$
16. $\frac{x}{5} = 7$
17. $\frac{2x}{3} - 1 = 7$
18. $2x - 7x = 25$
19. $2(3x + 4) = 26$
20. $6x - 3 = 4x + 5$

Solve the following problems. Write down all of the steps and show your work. Make sure you answer the question appropriately.

21. The sum of 12 and three times a number is 21. Find the number.

22. Mary and Joe together weigh 282 pounds. Joe weighs 48 pounds more than Mary. Find Joe and Mary's weight.

23. The seniors on the basketball team scored 35% of the points in the game. If the seniors scored 21 points, how many points did the entire team score?

24. I paid \$4.24 for my meal at Sonic, which included a sales tax rate of 6%. What was the total before they increased the price by adding tax?

25. The cost of a pair of tennis shoes is \$145. If they will be marked down 15% on Friday, what will the price be after the markdown?

26) What percent of your semester grade is the mid term worth?

_____ % = _____ (decimal) = _____ completely simplified fraction

27. Adult tickets to a play cost \$4.25. Student tickets cost \$3.75. If 44 tickets have been sold with ticket sales totaling 181.50, how many tickets of each type have been sold?

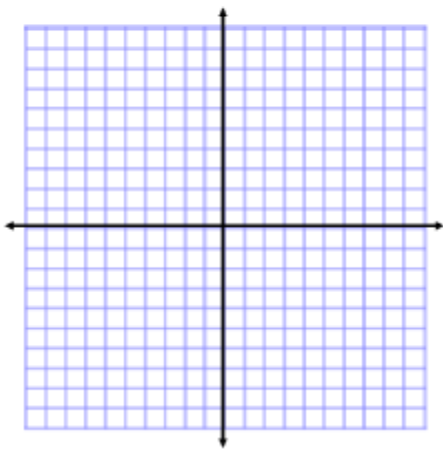
	Number	x	Price	=	Cost
Student					
Adult					

28. Two trains leave Altamont at the same time. One travels north at 65 MPH and the other travels south at 60 MPH. In how many hours will they be 875 miles apart?

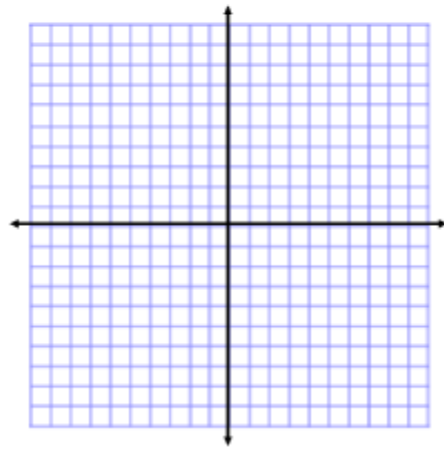
	Rate of Speed	x	Time Traveled	=	Distance Traveled
Train 1					
Train 2					

Graph the following linear equations using any method.

29. $y = 3x + 2$



30. $3x + 4y = 8$



31. Slopes of parallel lines are _____.

32. Slopes of perpendicular lines are _____.

Find the slope of the line and tell whether the line is ~~increasing or decreasing~~ (positive or negative slope)

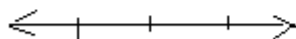
33. Line passes through (3, 8) and (6, -10)

Given the following information about a line, write its equation in slope-intercept form.

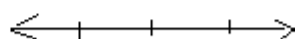
34. A line has a slope of 4 and passes through (3, 5).

Solve and graph the following inequalities on a number line.

35. $3x + 1 < 13$



36. $4 - 2x \geq 13$



Solve the following system of equations using any method. Describe the lines.

<p>37. $x + y = 16$ $x - y = 10$</p>	<p>38. $x + y = 5$ $3x + 2y = 11$</p>	<p>a) parallel b) same line c) crossing d) crossing perpendicular</p>
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39. If there is no solution to a system of equations, describe the relationship of the two lines involved in the system.

40. The library is having a book sale. Hardcover books sell for \$4 each, and paperback books are \$2 each. If Connie spends \$26 for 8 books, how many hardcover books did she buy?

41. Name 4 ways to determine by the EQUATION of the function if it is NOT LINEAR.

42. What is the y-intercept for the graph of the equation $3x - 2y = 5$?

- A. $\frac{5}{2}$
- B. $-\frac{5}{2}$
- C. $-\frac{3}{2}$
- D. $\frac{3}{2}$

43. The graph of which equation has a steeper slope than the graph of $y = 2x - 3$?

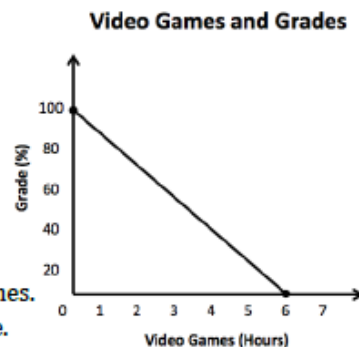
- A. $y = -2x + 3$
- B. $y = -\frac{1}{2}x + 3$
- C. $y = x + 3$
- D. $y = 3x + 3$

Analyze the following graphs and circle the best answer.

45. The function on the graph to the right represents the relationship between academic grade and the number of hours spent playing video games in a day.

What does the y-intercept on the graph represent?

- A. Students who play video games don't get very good grades.
- B. A student who gets a 50% in class spends 3 hours a day playing video games.
- C. A student who plays 6 hours a day playing video games has a failing grade.
- D. Students who play no video games have a grade of 100% in class.



46. Given the function $y = -\frac{2}{3}x + 1$, if the y-intercept is increased by 2, how would the graph of the function change?

- A. The line is shifted 2 units up.
- B. The line is shifted 2 units down.
- C. The line is shifted 3 units up.
- D. The line is shifted 3 units to the left.

47. On the line given by the equation $y = 3x - 5$, if the slope of the line is increased by 2, how is the graph affected?

- A. The line will rise faster from left to right.
- B. The line will fall slower from left to right.
- C. The line will rise slower from left to right.
- D. There is no change to the graph of the line as long as the y-intercept is the same.

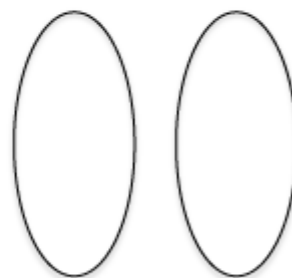
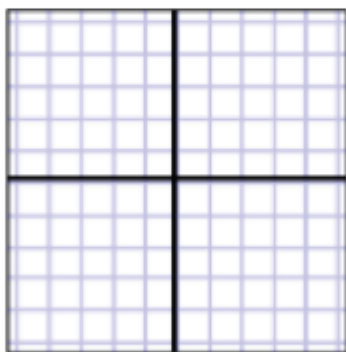
48a The x-value of a function is the input. This is called the _____.

48b The y-value of a function is the output. This is called the _____.

Express each relation as a table, a graph, and a mapping. Then determine the domain and range. (Make sure you do all of them!)

48c (3, 1), (-1, 3), (4, 5), (0, -4)

x	y

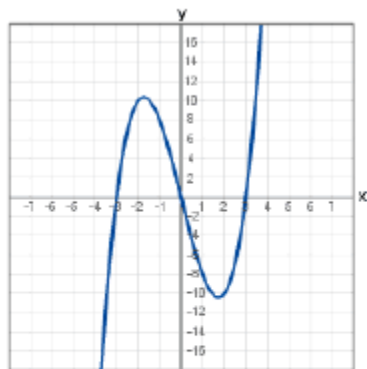


Domain: _____

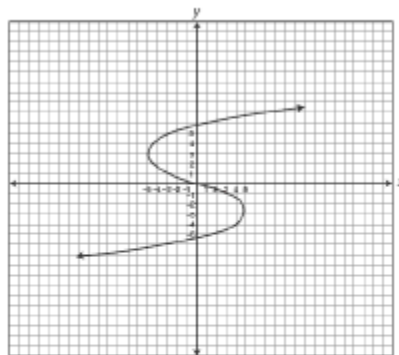
Range: _____

State if the following graphs are functions. (Yes or No)

49a



49b



Find the value of each indicated function.

50a $p(x) = 4x - 8$

$p(3)$

$p(0)$

50b $f(x) = x^2 + 3$

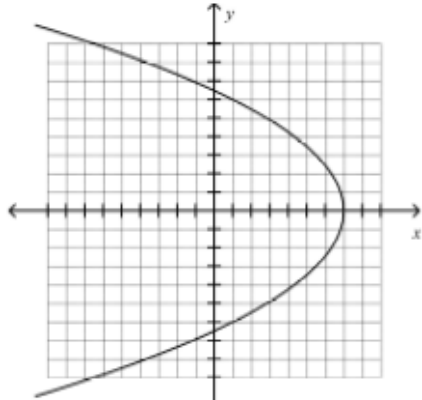
$f(f(3))$

$f(g(-2))$

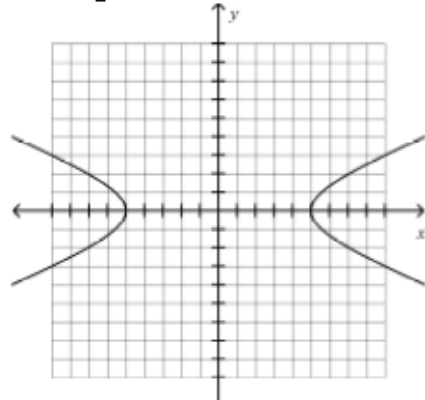
MULTIPLE CHOICE MIDTERM PRACTICE

____ 1. Use the vertical line test to determine which of the following relations is a function.

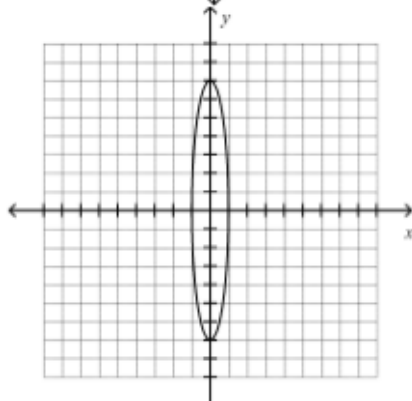
a.



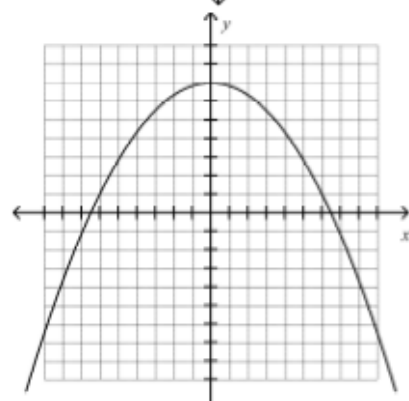
c.



b.



d.



____ 2. Evaluate $f(x) = -2x - 5$ for $x = 3$.

a. -11

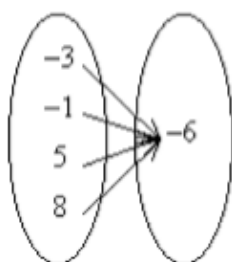
b. 1

c. -6

d. 11

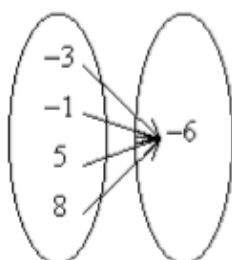
3. Identify the mapping diagram that represents the relation and determine whether the relation is a function.
 $\{(-3, -6), (-1, -6), (5, -6), (8, -6)\}$

a.



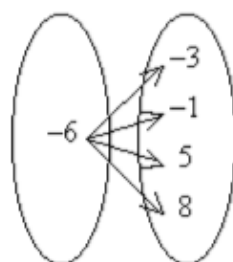
The relation is not a function.

b.



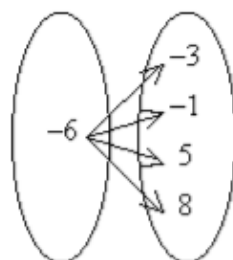
The relation is a function.

c.



The relation is a function.

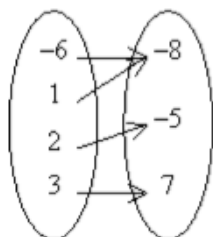
d.



The relation is not a function.

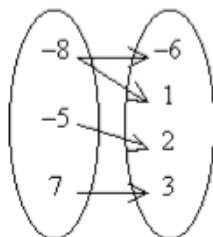
4. Identify the mapping diagram that represents the relation and determine whether the relation is a function.
 $\{(-8, -6), (-5, 2), (-8, 1), (7, 3)\}$

a.



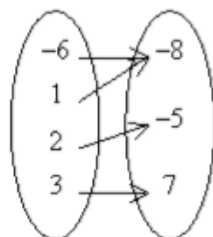
The relation is a function.

b.



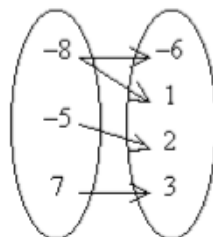
The relation is a function.

c.



The relation is not a function

d.



The relation is not a function.

The relation is a function.

The relation is not a function.

5.

x	$f(x)$
2	-8
3	-12
4	-16
5	-20

- a. $f(x) = -4x$ b. $f(x) = 4x$ c. $f(x) = x - 4$ d. $f(x) = x + 4$

6.

x	$f(x)$
3	7
4	8
5	9
6	10

- a. $f(x) = x - 4$ b. $f(x) = 4x$ c. $f(x) = x + 4$ d. $f(x) = -4 - x$

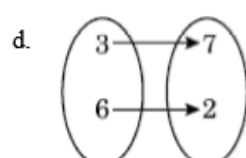
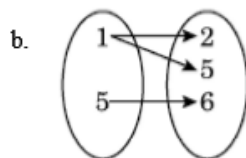
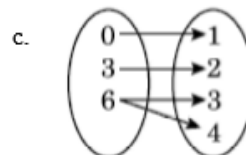
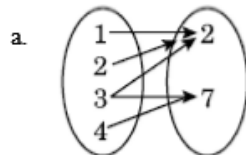
7. A zucchini plant in Darnell's garden was 10 centimeters tall when it was first planted. Since then, it has grown approximately 0.5 centimeters per day.

a. Write a rule to describe the function.

b. After how many days will the zucchini plant be 0.185 meters tall?

- a. $h(d) = 0.5d + 10$; 17 days c. $h(d) = \frac{d}{0.5} + 10$; 4 days
b. $h(d) = 10d + 0.5$; 1.1 days d. $h(d) = 0.5d$; 37 days

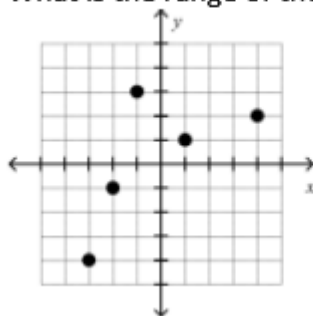
8. Which of these data sets represents a function?



9. Given the function, $f(x) = 25x + 750$, what is the range of this function when the domain is $\{2, 4, 6, 8, 10\}$?

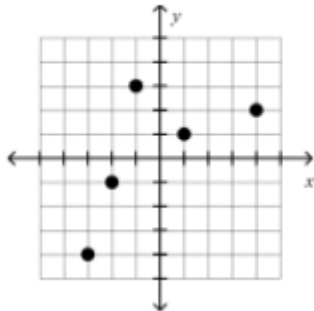
- a. $\{750, 800, 850, 900, 950\}$ c. $\{800, 825, 850, 750, 775\}$
b. $\{775, 800, 825, 850, 875\}$ d. $\{800, 850, 900, 950, 1,000\}$

10. What is the range of the graph below?



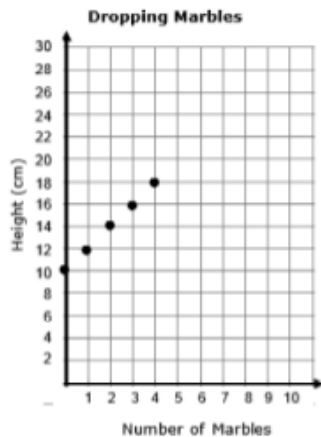
- a. $-4 \leq y \leq 3$
b. $-3 \leq x \leq 4$
c. $\{-3, -2, -1, 1, 4\}$
d. $\{-4, -1, 1, 2, 3\}$

11. What is the domain of the graph below?



- a. $-4 \leq y \leq 3$
- b. $-3 \leq x \leq 4$
- c. $\{-3, -2, -1, 1, 4\}$
- d. $\{-4, -1, 1, 2, 3\}$

12. Sawyer dropped one marble at a time into a cylinder containing water. The data set he collected is represented by the scatterplot below.



Assume the cylinder did not overflow. What is the best prediction of the height, in centimeters, of the water after a total of 14 marbles is dropped?

- a. 34
- b. 36
- c. 38
- d. 40

13. Write the equation that describes the line in slope-intercept form. slope = 4, point (3, -2) is on the line

- a. $y = 4x + 14$
- b. $y = 4x - 14$
- c. $y = 4x + 10$
- d. $y = 4x - 2$

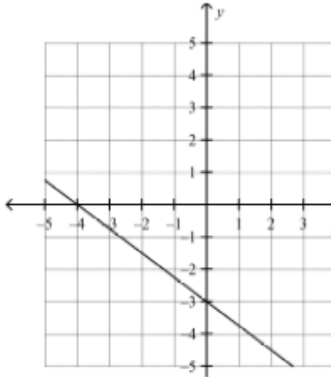
14. You start with \$200 in a checking account. Each month, you withdraw 20 dollars. Write an equation to model the amount of money in the checking account.

- a. $y = 20x + 200$
- b. $y = 200x + 20$
- c. $y = -20x + 200$
- d. $y = -200x + 20$

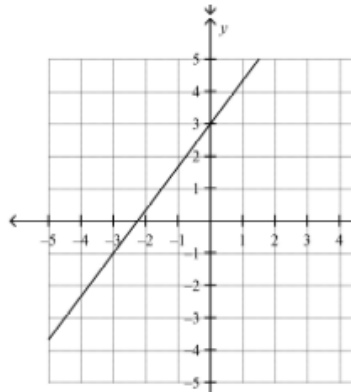
15 Graph the equation.

$$y = \frac{3}{4}x - 3$$

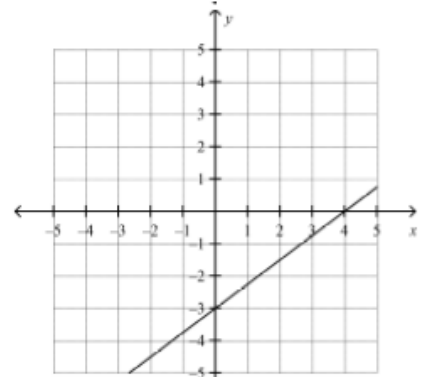
a.



b.



c.



16. $-3x + 9y = 18$; Find the x-intercept and y-intercept of the line.

- a. x-intercept is 2; y-intercept is -6 .
b. x-intercept is -3 ; y-intercept is 9.
c. x-intercept is -6 ; y-intercept is 2.
d. x-intercept is 9; y-intercept is -3 .

17. Find an equation of the line with slope 9 and y-intercept 3.

- a. $y = \frac{1}{3}x + 9$
b. $y = 9x + 3$
c. $y = 3x + 9$
d. $y = 3x - 3$

18. Find the equation of the line in point-slope form that passes through $(10, -9)$ and has a slope of $m = -2$

- a. $y - 10 = -2(x + 9)$
b. $y - 9 = -2(x + 10)$
c. $y - 9 = -2(x - 10)$
d. $y + 9 = -2(x - 10)$