

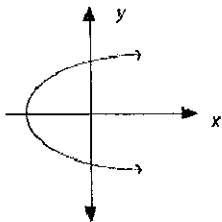
MIDTERM STUDY GUIDE  
Algebra I

Name: \_\_\_\_\_  
Period: \_\_\_\_\_ Date \_\_\_\_\_

SHOW ALL WORK ON SEPARATE SHEET! NO WORK NO CREDIT!

1. Evaluate  $f(x) = -2x + 4$  if  $\{x: x=0,1,2,3\}$ . What are the domain values?  
What are the range values?

2. Determine if the graph is a function. Explain your reasoning.



3. Is this a function:  $2x + 3 = 4x$ ? Explain your reasoning.

4. Solve  $\frac{2a - 1}{5} = -\frac{1}{2}a - 2$

5. Name the property used in the equation  $n + 5 = 0$ . Then, find the value of  $n$ .

6. Find the slope, y-intercept, and x-intercept of the line represented by the equation  $3x - 4y = 8$ .

7. Find the value of  $r$  so that the line through  $(2,3)$  and  $(r,-3)$  has a slope perpendicular to the graph of  $y = -\frac{x}{6} + 3$ .

8. Ms. Ortiz paid \$38 for 20 gallons of gasoline. Write a direct variation equation relating the cost of gasoline  $C$  to the number of gallons purchased  $n$ .

9. If  $y = -5$  when  $x = 2$ , find  $y$  when  $x = -3$  with direct variation.

10. If  $y = 2$  when  $x = 1$ , find  $x$  when  $y = -2$  with direct variation.

11. Evaluate  $\frac{3ab - c^2}{c}$  if  $a = 14$ ,  $b = 3$ , and  $c = 7$ .

12. If the length of a flagpole is 20 feet and the shadow it casts is 15 feet long, what is the diagonal length from the top of the flagpole to the tip of the shadow?

13. To what set(s) of real numbers does -7 belong?

14. To what set (s) of real numbers does .12345629... belong?

**Matching.**

Match the letter of the definition with the correct vocabulary term.

- 15. Function
- 16. Relation
- 17. Domain
- 18. Range

- a. The set of first numbers of the ordered pairs
- b. The set of second numbers of the ordered pairs
- c. A relation in which each element of the domain is paired exactly one element of the range.
- d. A set of ordered pairs

Match the letter of the example with the correct property.

- 19. Associative Property
- 20. Commutative Property
- 21. Distributive Property
- 22. Substitution Property

- a.  $a(b + c) = ab + ac$
- b.  $a + b = b + a$
- c. if  $a = b$ , then  $a$  may be substituted for  $b$
- d.  $a + (b + c) = (a + b) + c$

Match the letter of the property description with the correct property.

- 23. Reflexive
- 24. Symmetric
- 25. Transitive
- 26. Substitution

- a. A quantity may be substituted for its equal in any expression.
- b. Any quantity is equal to itself.
- c. If one quantity equals a second quantity, then the second quantity equals the first.
- d. If one quantity equals a second quantity and the second quantity equals a third quantity, then the first quantity equals the third quantity.

27. Evaluate  $4v^2 - (n^2 - 3s)$  if  $n = 8$ ,  $s = -4$  and  $v = 7$ .

28. Translate this sentence into an equation. *Twelve times a number  $r$  is the same as two times the sum of  $r$  and  $p$ .*

29. Solve  $5(a - 12) = 8(3a + 2)$

30. The surface area  $A$  of a sphere is  $A = 4\pi r^2$  where  $r$  is the radius of the sphere. What is the radius, rounded to the nearest tenth, of a ball with surface area equal to 85 square inches?

31.  $\sqrt{169}$  is a member of which sets of real numbers? Give all that apply.

32. Solve and graph:  $\frac{5t + 9}{2} \geq 4t$

33.  $2(5x - 4) \geq 7(x - 2)$

34. Students in a local university will see their student fees increase from \$954 in 2002 to \$982 in 2003. Assuming this is a linear trend, what is the rate of change which describes this growth in fees?

35. Write an equation of the line with slope 2 and y-intercept -6.

36. Write an equation that passes through (-5, 4) and has rate of change -3.

37. Write an equation of the line that passes through (0, -4) and (5, -4).

38. Write an equation of the line that passes through (1, 0) and (5, -1).

39. Write an equation of the line through (-3, 4) and slope is undefined.

40. Write an equation of the line with slope  $-3/5$  and y-intercept 0.

41. Find the equation of the line parallel to  $y = 4x - 2$  and going through the point (-1, -2).

42. Find the equation of the line parallel to  $y = 3$  and going through the point  $(0, 6)$ .
43. Find the equation of the line perpendicular to  $4x + 3 = 3x$  and going through the point  $(3, -4)$ .
44. Find the equation of the line perpendicular to  $2x + 5y = -10$  and going through the point  $(-1, -7)$ .
45. Determine the value of  $x$  so the line that passes through  $(-1, 4)$  and  $(5, x)$  has a rate of change of  $-1/6$ .
46. Find the  $x$  and  $y$  intercepts of the graph of  $10x = 80$ .
47. Solve and graph:  $\frac{2+4b}{2} \geq 3b+6$
48. If  $f(x) = 3x + 4$ , find  $f(-3)$ .
49. If  $g(x) = 3x^2 - 2$ , then find  $g(-1)$ .
50. If  $g(x) = 3x^2 - 2$ , then find  $g(x + 3)$ .
51. Solve  $A = 1/2h(b+c)$  for  $c$ .
52. Solve  $\frac{-3x-4y}{-2} = 10$  for  $x$ .
53. Solve  $1.9 + 1.7x \leq 2.1(3 + x)$
54. Six times a number  $x$  plus 2 times a number  $y$  is 3 more than 4 times a number  $x$ . Solve for  $x$ .
55. In a bird sanctuary, 30% of the birds are hummingbirds. If there are about 350 birds in the sanctuary at any given time, how many are hummingbirds?

56. Average attendance at a school's basketball games increased from 1000 to 1500 last year. One student said that represented a 150% increase. Explain the student's error. What is the actual percent increase?

57. Solve and graph on a number line:  $9 < 6 - b < 12$

58. Solve and graph on a number line:  $4 + 3n \geq 1$  OR  $-5n > 25$

59. A drama club wants to raise at least \$500 in ticket sales for its annual show. The members of the club sold 50 tickets at a special \$5 rate. The usual ticket price the day of the show is \$7.50. At least how many tickets do they have to sell the day of the show to meet the goal? Show an inequality and how you obtain your answer.

60. Solve:  $|4k - 2| = 11$

61. Solve:  $|2x - 1| - 7 > 0$

62. Solve:  $|3d + 5| < -2$

63. Linear or nonlinear? X: 0 1 2 3 4  
Y: 1 2 5 10 17

~~64. Find the second and twentieth terms of the sequence  
 $A(n) = 2 + (n-1)(2.5)$~~

~~65. Tell whether this sequence is arithmetic. If it is, give the rule to represent it: 3, 3.25, 3.5, 3.75, ...~~

~~66. In this situation, is there likely to be a correlation? If so, does the correlation reflect a causal relationship? Explain.~~

~~A. The number of loaves of bread baked and the amount of flour remaining.~~

~~B. The shoe size and the salary of a teacher.~~

67. Analyze the following data:

Text Messages Sent:	20	50	80
Monthly Cost (\$):	41.99	44.99	47.99

- Write an equation for the data in slope intercept form.
- Describe what the slope means in the context of this situation.
- Describe what the y-intercept means in the context of this situation.

68. Graph and compare  $y = |x|$  and  $y = |x - 4|$ . How are they the same or different?

69. Graph and compare  $y = |x|$  and  $y = |x| + 3$ . How are they the same or different?

70. Solve the system of equations:

$$x + y = 5$$

$$x + y = -2$$

71. Solve the system of inequalities by graphing:

$$x > -3$$

$$-3x + y \geq 6$$

72. Suppose you add two linear equations that form a system, and you get the result shown below. How many solutions does the system have?

A.  $x = 8$

B.  $0 = 4$

C.  $0 = 0$

73. A farmer plans to create a rectangular garden that he will enclose with chicken wire. The garden can be no more than 30 feet wide. The farmer would like to use at most 180 feet of chicken wire. Graph the system to show all possible solutions.

~~74. A chemist has one solution containing 30% insecticide and another solution containing 50% insecticide. How much of each solution should the chemist mix to get 200 L of a 42% insecticide?~~

75. Which of the following are linear?

A.  $p = 2n$

B.  $p = 4^n$

C.  $p = 2(n - 3) + 6$

D.  $p = n(n + 8)$

E.  $p = 0.25(4^n)$

F.  $p = 17 + n(n + 3)$