Name: _____

Math 0310
Exam #3 Review (Sections 6.1-6.5, 6.7, 7.1-7.6, 9.1, 9.3)
Do not use a calculator on this review.

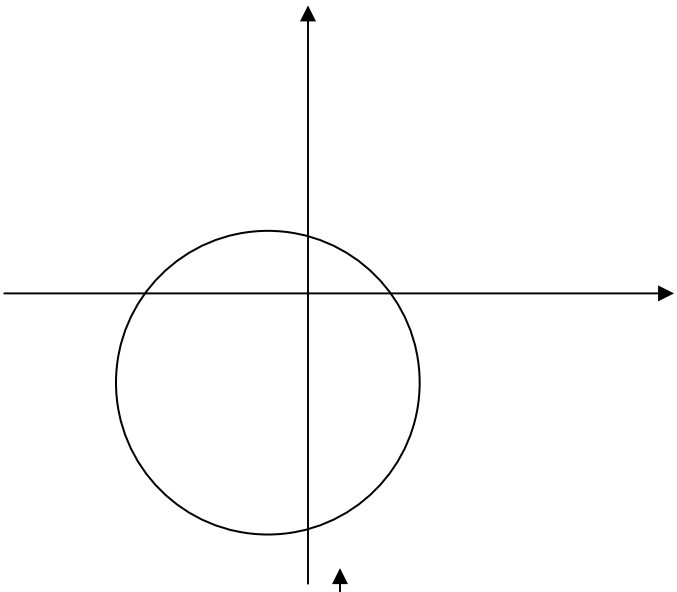
Use graph paper for all your graphs!

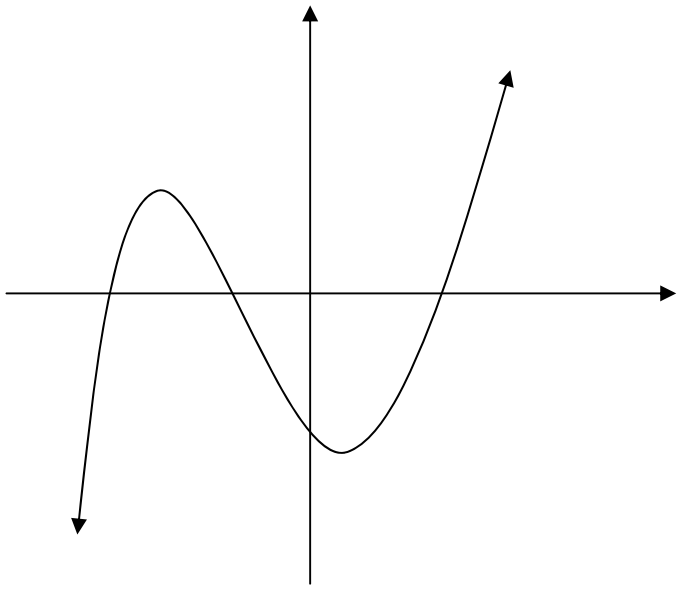
1. Graph the function $f(x) = x^2 + 3$.

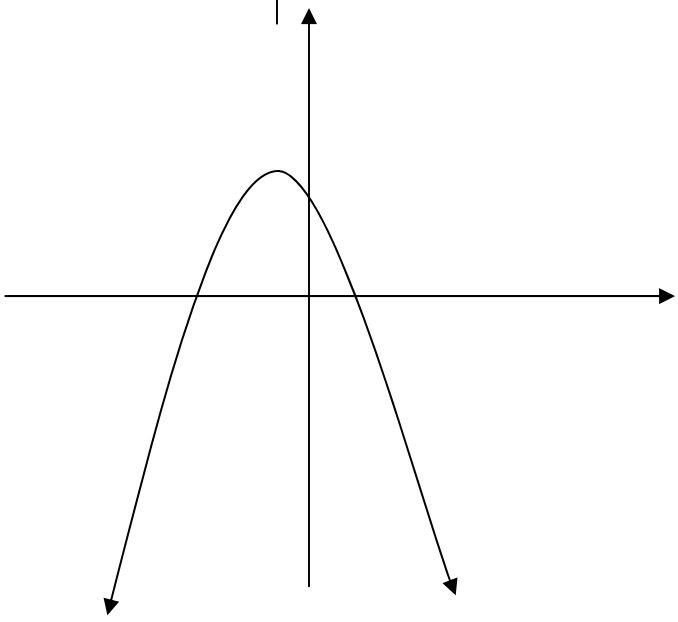
2. Graph the function $f(x) = \sqrt{x-5}$.

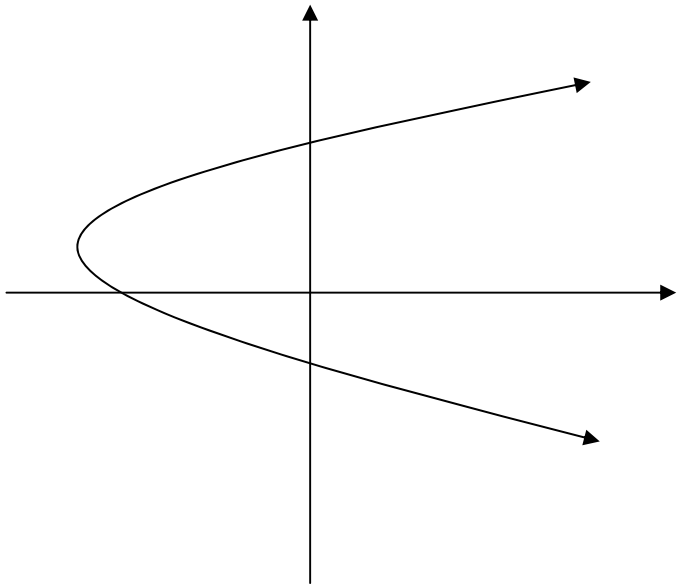
3. Graph the equation $x = y^2 - 1$.

4. Which of the following graphs represent *y* as a function of *x*?









5. Suppose that $f(x) = -2x + 1$, $g(x) = 2x^2 - 3x + 5$, and $h(x) = \dfrac{3x - 7}{5 - 2x}$. Calculate the indicated function values.

(a) $f(2)$

(b) $f(-3)$

(c) $f(a)$

(d) $f(x+1)$

(e) $g(-2)$

(f) $g(3) + f(-1)$

(g) $g(-a)$

(h) $g(x-3)$

(i) $h(2)$

(j) $g(f(2))$

(k) $f(g(2))$

(l) $f(2)g(2)$

(m) $h\left(\dfrac{2}{5}\right)$

(n) $h(3) - h(1)$

(o) $2h(3)$

(p) $-g(x)$

6. Find the slope of the line through the points $(-2,5)$ and $(-6,-3)$.

Answer: _____

7. Find the slope of the line through the points $(2,4)$ and $\left(2,-\frac{1}{3}\right)$.

Answer: _____

8. Find the slope of the line through the points $\left(\frac{1}{2},\frac{2}{3}\right)$ and $\left(-\frac{3}{4},\frac{1}{9}\right)$.

Answer: _____

9. Find the slope of the line through the points $(-3,-4)$ and $(6,-4)$.

Answer: _____

Use your own graph paper and a straightedge for Problems #10-22.

10. Graph the equation.

$$3x - y = 9$$

11. Graph the equation.

$$4x + 3y = 6$$

12. Graph the equation.

$$-2x + 1.5y = 3.6$$

13. Graph the equation.

$$3 - 2x = 6$$

14. Graph the equation.

$$y = x$$

15. Graph the equation.

$$y = -3$$

16. Graph the equation.

$$x = 4$$

17. Find the x- and y-intercepts. Graph the equation.

$$x - 4y = 6$$

x-intercept: _____

y-intercept: _____

18. Find the x- and y-intercepts. Graph the equation.

$$-5x - 7y = 14$$

x-intercept: _____

y-intercept: _____

19. Find the x- and y-intercepts. Graph the equation.

$$\frac{5}{6}x+\frac{3}{4}y=5$$

x-intercept: _____

y-intercept: _____

20. Find the x- and y-intercepts. Graph the equation.

$$2.1x-3.5y=2.8$$

x-intercept: _____

y-intercept: _____

21. Find the x- and y-intercepts. Graph the equation.

$$8x+5y=0$$

x-intercept: _____

y-intercept: _____

In Problems #22-38, write the equation of the line in slope-intercept form, if possible.

22. Find the equation of the line with slope 4 through the point $(5,-3)$. Graph it.

Answer: _____

23. Find the equation of the line with slope $-\frac{3}{2}$ through the point $(-3,2)$. Graph it.

Answer: _____

24. Find the equation of the line with slope -2 and *x*-intercept 4. Graph it.

Answer: _____

25. Find the equation of the line with slope 3 and *y*-intercept 2.

Answer: _____

26. Find the equation of the line with slope 0 through the point $(2,3)$.

Answer: _____

27. Find the equation of the line with undefined slope through the point $(-2,1)$.

Answer: _____

28. Find the equation of the line through the points $(-2,-4)$ and $(3,-6)$.

Answer: _____

29. Find the equation of the line through $(4,0)$ and $(4,-192)$.

Answer: _____

30. Find the equation of the line with *x*-intercept -3 and *y*-intercept -2.

Answer: _____

31. Find the equation of the line through $(0,-2)$ and $(5,-2)$.

Answer: _____

32. Find the equation of the line through $(1,3)$ and parallel to $2x-5y=6$.

Answer: _____

33. Find the equation of the line through $\left(-2,\frac{1}{3}\right)$ and perpendicular to $x+3y=2$.

Answer: _____

34. Find the equation of the line through the origin that is perpendicular to $x=2y+7$.

Answer: _____

35. Find the equation of the line through $(-1, 2)$ and perpendicular to the line $2x - y + 2 = 0$.

Answer: _____

36. Find the equation of the line that contains the point $(-8,-10)$ and parallel to the line whose equation is $y = -4x + 3$.

Answer: _____

37. Find the equation of the line containing $(1,-2)$ and perpendicular to *x*-axis.

Answer: _____

38. Find the equation of the line passing through (1, 2) and parallel to $x=3$.

Answer: _____

Use your own graph paper and a straightedge for Problems #39-42.

39. Sketch the graph of the solution set to $y < \frac{5}{2}$.

40. Sketch the graph of the solution set to $2x \geq y$.

41. Sketch the graph of the solution set to $3x + y > 5$.

42. Sketch the graph of the solution set to the system of inequalities.

$$3y - 4x < 12.$$

$$6x - y \leq 4$$

43. Solve the following quadratic equation using Extraction of Roots.

$$x^2 = 16$$

Answer: _____

44. Solve the following quadratic equation using Extraction of Roots.

$$x^2 - 121 = 0$$

Answer: _____

45. Solve the following quadratic equation using Extraction of Roots.

$$9x^2 + 16 = 0$$

Answer: _____

46. Solve the following quadratic equation using Extraction of Roots.

$$3x^2 + 1 = 0$$

Answer: _____

47. Solve the following equation using Extraction of Roots.

$$(5x - 4)^2 + 6 = 8$$

Answer: _____

48. Solve the following equation by completing the square.

$$x^2 - 6x + 5 = 0$$

Answer: _____

49. Solve the following equation by completing the square.

$$x^2 - 2x - 1 = 0$$

Answer: _____

50. Solve the following equation by completing the square.

$$9x^2 - 12x + 20 = 0$$

Answer: _____

51. Solve the following equation by completing the square.

$$3x^2 + 8x + 3 = 0$$

Answer: _____

52. Solve the following equation by completing the square.

$$2x^2 - 2x - 1 = 0$$

Answer: _____

53. Solve the following equation by completing the square.

$$25x^2 + 30x - 16 = 0$$

Answer: _____

54. Solve the following equation using the quadratic formula.

$$-5x - 2 = -3x^2$$

Answer: _____

55. Solve the following equation using the quadratic formula.

$$(x + 3)(2x - 1) = 15$$

Answer: _____

56. Solve the following equation using the quadratic formula.

$$x^2 + 6x + 9 = 2$$

Answer: _____

57. Solve the following equation using the quadratic formula.

$$10 = 6x - x^2$$

Answer: _____

58. Solve the following equation using the quadratic formula.

$$\frac{1}{13} - \frac{4}{13x} + \frac{1}{x^2} = 0$$

Answer: _____

59. Use the discriminant to describe the solutions of the equation.

$$9x^2 - 12x + 4 = 0$$

Answer: _____

60. Use the discriminant to describe the solutions of the equation.

$$2x^2 - 7x - 4 = 0$$

Answer: _____

61. Use the discriminant to describe the solutions of the equation.

$$3x^2 - 5x + 1 = 0$$

Answer: _____

62. Use the discriminant to describe the solutions of the equation.

$$5x^2 - x + 6 = 0$$

Answer: _____

63. The sum of two numbers is 2 and the sum of their squares is $\frac{5}{2}$. Find the two numbers.

Answer: _____

64. Val and Rosemary have a rectangular swimming pool that is 8 feet wide and 12 feet long. They wish to build a tile border of uniform width around the pool. They have 124 square feet of tile. How wide is the border?

Answer: _____

65. The height of a triangle is 5 cm less than twice the base. The area of the triangle is 21 square centimeters. Find the height and base of the triangle.

Answer: _____

66. One pipe can fill a tank 3 hours faster than another pipe. Together they fill the tank in 5 hours. How long does it take each pipe to fill the tank?

Answer: _____

67. Cory and Kiki ran a $\frac{1}{2}$-mile route around their subdivision. Cory ran 4 miles/hour slower than Kiki and took 2 minutes longer to finish. How fast did each run?

Answer: _____

68. Determine whether the given ordered pair is a solution of the system.

$$2x-5y=-37, \quad (4,9)$$
$$-3x+4y=24$$

69. Determine whether the given ordered pair is a solution of the system.

$$x-4y=-5, \quad \left(-1,-\frac{3}{2}\right)$$
$$3x+2y=-6$$

When solving the following systems, don't forget to check your answers!!!

70. Solve the system using the substitution method. Classify the system as independent, inconsistent, or dependent.

$$3x-7y=8$$
$$x=-2$$

Answer: _____

Circle one: independent inconsistent dependent

71. Solve the system using the substitution method. Classify the system as independent, inconsistent, or dependent.

$$3x+8y=1$$
$$x+y=2$$

Answer: _____

Circle one: independent inconsistent dependent

72. Solve the system using the elimination method. Classify the system as independent, inconsistent, or dependent.

$$2x - 6y = 4$$
$$-x + 3y = -2$$

Answer: _____

Circle one: independent inconsistent dependent

73. Solve the system using the elimination method. Classify the system as independent, inconsistent, or dependent.

$$8x + 3y = 9$$
$$6x + 5y = 26$$

Answer: _____

Circle one: independent inconsistent dependent

74. Solve the system using the method of your choice. Classify the system as independent, inconsistent, or dependent.

$$2x + 3y = 34$$
$$5x - 4y = -7$$

Answer: _____

Circle one: independent inconsistent dependent

75. Solve the system using the method of your choice. Classify the system as independent, inconsistent, or dependent.

$$-2x - y = 4$$
$$6x + 3y = 5$$

Answer: _____

Circle one: independent inconsistent dependent

76. Solve the system using the method of your choice. Classify the system as independent, inconsistent, or dependent.

$$8x + 2y = 7$$
$$7x + 3y = 3$$

Answer: _____

Circle one: independent inconsistent dependent

77. Solve the system using the method of your choice. Classify the system as independent, inconsistent, or dependent.

$$\frac{2}{3}x + \frac{7}{15}y = -1$$
$$\frac{5}{4}x + \frac{9}{5}y = 12$$

Answer: _____

Circle one: independent inconsistent dependent

When solving the following word problems, remember to check your answer against the original problem statement!

78. The sum of two numbers is 12. One number is 30 more than five times the other number. Find the two numbers.

Answer: _____

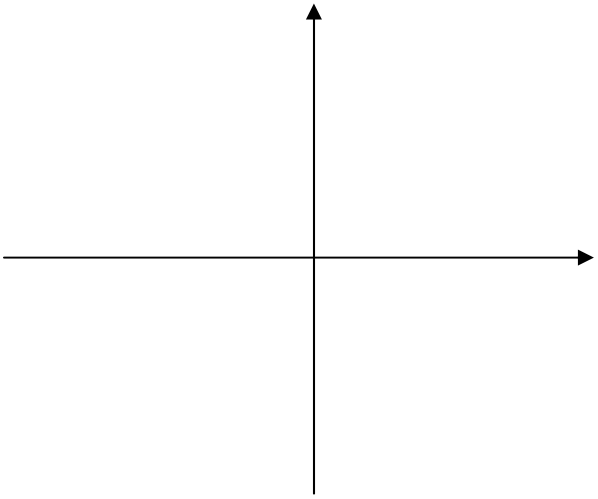
79. Rita has $1150 in $20 bills and $50 bills. The number of $20 bills is 1 less than twice the number of $50 bills. How many of each kind of bill does she have?

Answer: _____

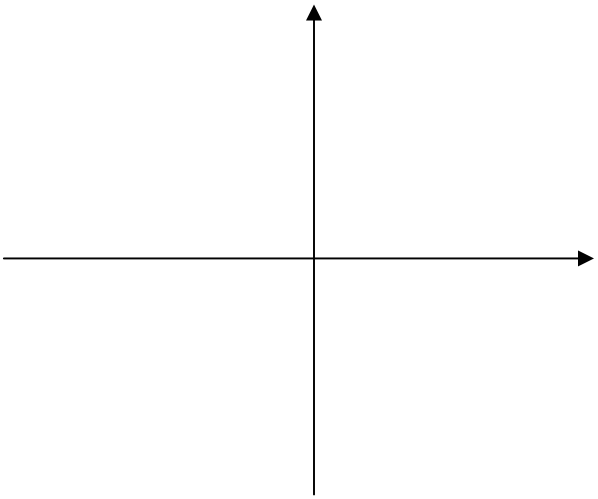
80. Ken sold 48 tickets to Dog World of Moss County, featuring Dusty, the extremely cute papillon. Adult tickets cost $24.75 and children's tickets cot $18.50. He collected $925.50 from the sale of the tickets. How many of each kind of ticket did he sell?

Answer: _____

85. In *complete sentences*, describe the graph of a dependent system of two equations. Illustrate your description with an example graph. State the number of solutions.



86. In *complete sentences*, describe the graph of an inconsistent system of two equations. Illustrate your description with an example graph. State the number of solutions.



87. In *complete sentences*, describe the graph of a consistent, independent system of two equations. Illustrate your description with an example graph. State the number of solutions.