Algebra 1: 2nd Semester Exam Review **Name _____ Period ____**

1. Write each expression in rational exponent form.

a. $\sqrt[3]{10}$ **b.** $\sqrt[4]{d}$

2. Write each expression in radical form.

a. $11^{\frac{1}{2}}$ **b.** $a^{\frac{1}{5}}$

3. Evaluate the expression $\sqrt[4]{625}$ **.**

What is the simplified form of each expression?

4. $(-3.2)^0$ **5.** $6c^{-3}t^3$ **6.** $\frac{1}{a^{-5}}$

7. $\frac{6}{g^{-3}h}$ **8.** $7x^{-8} \cdot 6x^3$ **9.** $x^8 \cdot 2y^{10} \cdot 5x^5$

10. $-4x^3 \cdot 2y^{-2} \cdot 5y^5 \cdot x^{-8}$ **11 11.** $(p^6)^2$ **1 12.** $(3h^3)^4$

13. $(-5g^4h^6)^2(g^5h^5)^5$ **14.** $\frac{t^{11}}{t^2}$ **15.** $\frac{a^{-2}}{a^4}$

16. $\frac{g^7h^8}{g^{11}h^2}$ **11 17.** $\left(\frac{1}{2j^4}\right)^2$ **1 118.** $\left(\frac{6t^4}{5y^2}\right)^5$

19. Write the function f(x) = 2^x as a reflection over the y – axis.

20. Write the function f(x0 = 2^x as a reflection over the x – axis.

Solve each system of equations by substitution.

21. $\begin{cases} y = 2x - 3 \\ x = 4 \end{cases}$ **22.** $\begin{cases} 2x + y = 9 \\ y = 5x + 2 \end{cases}$

Solve each system of equations using the linear combinations (elimination) method.

23. $\begin{cases} 4x - y = 2 \\ 2x + 2y = 26 \end{cases}$

24. $\begin{cases} 3x + 5y = 8 \\ 2x - 5y = 22 \end{cases}$

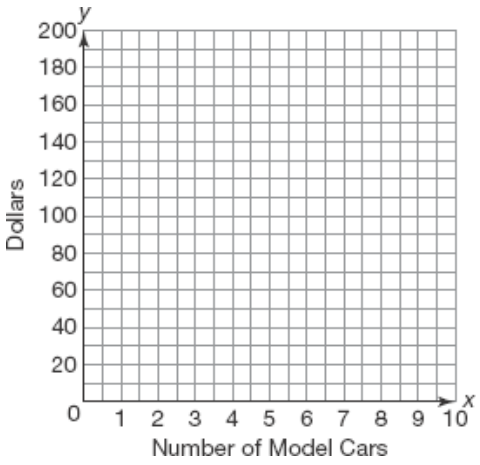
25. Draw a graph of a system of linear equations with infinite solutions.

26. Draw a graph of a system of linear equations with no solutions.

27. Draw a graph of a system of linear equations with one solution.

Write a system of linear equations to represent each problem situation. Define each variable. Then, graph the system of equations and estimate the break-even point. Explain what the break-even point represents with respect to the given problem situation.

28. Eric sells model cars from a booth at a local flea market. He purchases each model car from a distributor for $12, and the flea market charges him a booth fee of $50. Eric sells each model car for $20.



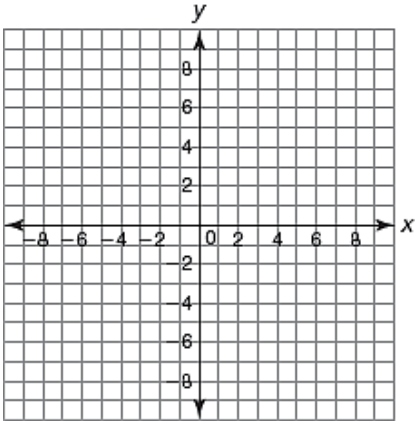
Tell whether the graph of each linear inequality will have a dashed line or a solid line. Explain your reasoning.

29. $x - 3y \leq 32$

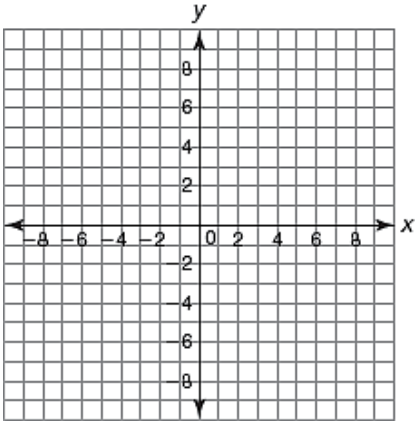
30. $y < 14x + 9$

Graph each linear inequality.

31. $y < 4x + 2$

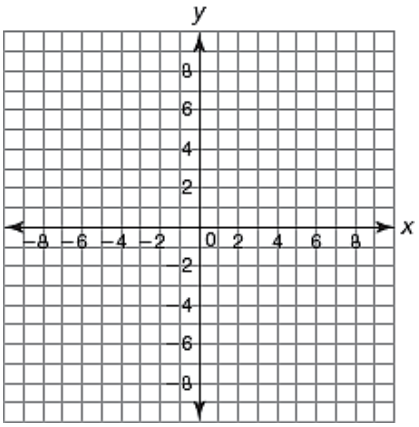


32. $y \geq -x + 10$

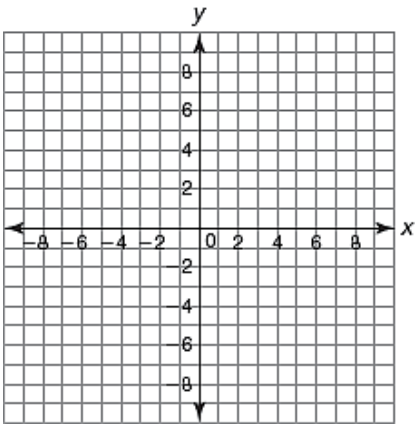


Graph each linear inequality.

33. y > x + 1

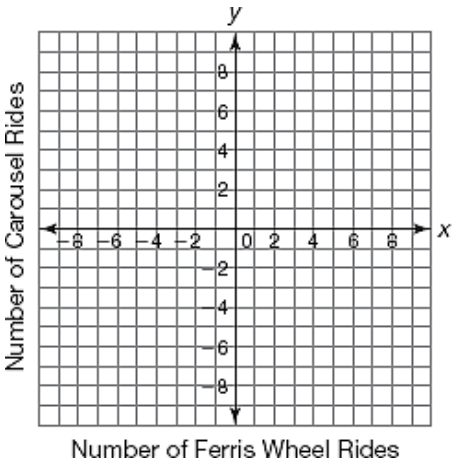


34. $3x - 4y \geq 8$



Graph each inequality and determine if the ordered pair is a solution for the problem situation.

35. Marcus has 50 tokens to spend at the school carnival. The Ferris wheel costs 7 tokens and the carousel costs 5 tokens. The inequality $7x + 5y \leq 50$ represents the possible ways Marcus could use his tokens on the two rides. Is the ordered pair (6, 3) a solution for the problem situation?



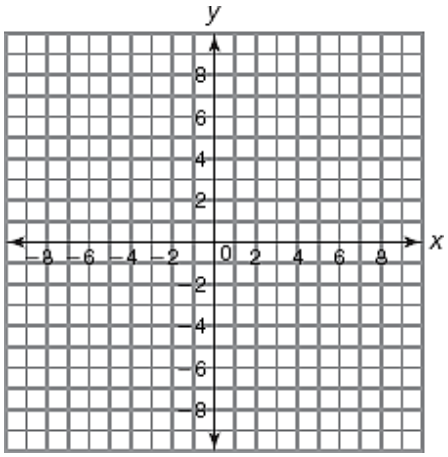
Write a linear inequality in two variables to represent each problem situation.

36. Tanya is baking zucchini muffins and pumpkin muffins for a school event. She needs at least 500 muffins for the event.

37. Patti makes decorative flower pots. It costs her $20 to purchase the materials for each pot. She wants to charge more than $6 per hour of labor plus her materials cost for each pot.

38. Graph the system of inequalities.

$$\begin{cases} y < 3x + 5 \\ y > -x + 3 \end{cases}$$



39. Carlos works at a movie theater selling tickets. The theater has 300 seats and charges $7.50 for adults and $5.50 for children. The theater expects to make at least $2000 for each showing. Write a system of inequalities to represent this situation. You do not have to solve.

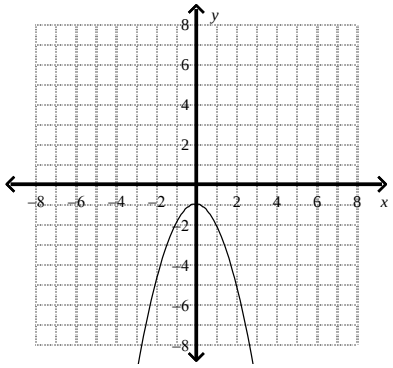
40. Is the point (-2, -10) a solution to the system of inequalities? $\begin{cases} 2x - y > 4 \\ -x + y \leq 7 \end{cases}$

41. Write a quadratic function that represents a parabola that opens downward and has *x*-intercepts $(-2, 0)$ and $(5, 0)$.

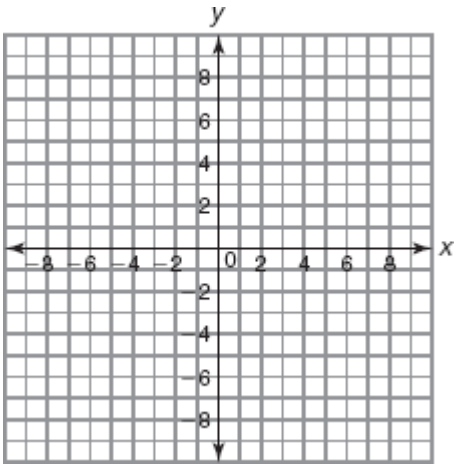
42. What are the x-intercepts of the function $f(x) = (x - 2)(x - 8)$?

43. Factor to determine the x-intercepts. $f(x) = x^2 + 8x + 12$

44. What are the coordinates of the vertex of the graph? Is it a maximum or minimum?



45. Graph the function $y = 0.5x^2$. State the domain and range.



46. How is the graph of $y = -4x^2 - 5$ different from the graph of $y = -4x^2$?

47. $f(x) = x^2 + 2x - 15$ Determine the vertex if the axis of symmetry is $x = -1$.

48. Determine the axis of symmetry of each parabola if the *x*-intercepts of a parabola are (3, 0) and (9, 0).

Identify the form of each quadratic function as either standard form, factored form, or vertex form. Then state all you know about the quadratic function's key characteristics, based only on the given equation of the function.

49. $f(x) = -(x-8)(x-4)$

50. $f(x) = 2x^2 - 1$

51. $f(x) = 5(x-3)^2 + 12$

Determine the vertex of each quadratic function given in vertex form.

52. $f(x) = \frac{1}{2}(x-2)^2 + 6$

Determine whether each expression is a polynomial. If the expression is not a polynomial, explain why it is not.

53. $-2w^3 + w^2 - 5$

54. $6m^{\frac{1}{2}}$

Write each polynomial in standard form. Classify the polynomial by its number of terms and by its degree.

55. $x^3 - x^2 - x^5$

Simplify each expression.

56. $(5x-8) + (7x+10)$

57. $(4m^2 + 9m) - (2m^2 + 6)$

58. $(-x^2 + 5x - 12) + (2x^2 - 6)$

59. $(10t^2 - 3t + 9) - (6t^2 - 7t)$

60. $(-7m^3 - m^2 - m) - (-10m^3 - m - 1)$

Identify the terms and coefficients in each expression.

61. $-3w^4 + w^2 - 9$

Determine the product of the polynomials using the Distributive Property.

62. $3x(x^2 + 5x - 1)$

63. $(x+2)(x^2 + 6x - 1)$

Determine the product of the polynomials using the Distributive Property.

64. $2x(x+6)$

65. $(2x+1)(x+8)$

Factor each of the following completely. If possible, factor out the greatest common factor first.

66. $x^2 - 9x + 18$

67. $4w^2 + 12w - 40$

68. $3m^3 + 36m^2 + 60m$

69. $x^2 - 2x - 8$

70. $x^2 + 4x - 12$

71. $x^2 + 4x + 4$

72. $x^2 - 10x + 25$

73. $5x^2 + 10x - 15$

74. $x^2 + 9x$

Factor and solve each quadratic equation. Check your answer.

75. $x^2 + 8x = 0$

76. $2t^2 + t - 3 = 0$

77. $x^2 + 5x + 6 = 0$

78. $x^2 - 3x - 4 = 0$

Simplify each square root (no decimal answers)

79. $\sqrt{45}$

80. $\sqrt{12}$

81. $\sqrt{32}$

Solve each quadratic equation. Write radical answers in reduced radical form.

82. $x^2 = 40$

83. $(x-5)^2 = 22$

84. $x^2 = 27$

Determine the unknown value that would make each trinomial a perfect square.

85. $x^2 - 10x +$ _____

86. $x^2 -$ _____$x + 81$

Determine the roots of each quadratic equation by completing the square. Round your answer to the nearest hundredth. Check your answer.

87. $x^2 + 4x - 6 = 0$

88. $x^2 + 10x + 2 = 0$

Determine the approximate zeros or roots of each function or equation using the Quadratic Formula. Round your answers to the nearest hundredth, if necessary.

89. $f(x) = x^2 + 3x - 5$

90. $f(x) = -3x^2 - x + 7$