Algebra 2 CP ISLO Exam Review - Part 1

Name _____   Period_____

Teacher_____

Exam Day _____ Time_____ Room_____

Bring to the Exam:
- #2 Pencil
- TI-84 GRAPHING calculator

Chapters/Sections covered on exam:
Summer Review Material
Systems of Equations with Three Equations and Three Unknowns (3-6)
Functions and Linear Modeling (2-1 and 2-4)
Absolute Value Equations, Inequalities, Graphs (1-5, 2-5, 2-6)
Quadratics (5-1 through 5-8)
Polynomials (6-1 and 6-2)

Note: School Policy mandates a policy for cheating on an exam to be a grade of zero for that exam. The term cheating includes the "intent to cheat"

ANSWERS ARE AT THE END OF THE PACKET

CALCULATOR INFORMATION:

DO NOT FORGET YOUR TI-84 CALCULATOR. THERE WILL NOT BE EXTRAS!!!!!

IT IS YOUR RESPONSIBILITY TO HAVE IT IN WORKING ORDER. INSTALL FRESH BATTERIES IF NECESSARY.

You may use your calculator for the entire exam, although most questions will not require you to use it. The questions that will require the calculator will be scattered throughout the test. It is your responsibility to know how to use your calculator. You must know the different set ups for the various types of problems. It is suggested that your calculator memory is cleared at the beginning of the exam, so that all settings are as they should be at the start of the test. Remember:

**At all times:
- MODE should all be left highlighted
- FORMAT (2nd zoom) should all be left highlighted

**For graphing functions (Y1= , Y2 = , ….)
- STAT PLOTS must be turned OFF

**For doing Stat plots (Scatter Plots): all the Y1 = , Y2 = , …must be cleared.

**Before entering data into LISTs, clear all LISTs

You must remember to turn things ON or OFF and to clear things as needed, depending on what you need to do. The proctor cannot and will not aid you. Your teacher will not answer those questions. This is your responsibility.
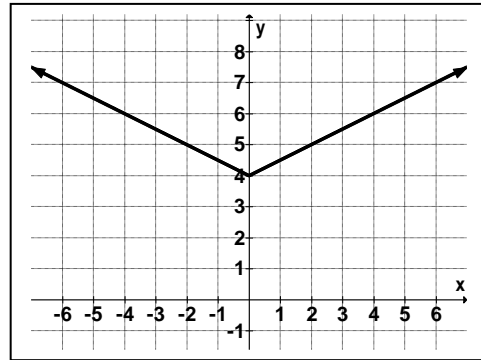
WORK HARD AND GOOD LUCK!!!!

1. Find f(–5) if f(x) = –8x – 1.

    a. 39
    b. – 41
    c. – 39
    d. 12

2. Which two linear equations represent the graph of $y = \frac{1}{2}|x| + 4$?

    a. $y = \begin{cases} -\frac{1}{2}x + 4, x > 0 \\ \frac{1}{2}x + 4, x \le 0 \end{cases}$

    b. $f(x) = \begin{cases} -2x + 4, x < 0 \\ 2x + 4, x \ge 0 \end{cases}$

    c. $y = \begin{cases} -\frac{1}{2}x + 4, x < 0 \\ \frac{1}{2}x + 4, x \ge 0 \end{cases}$

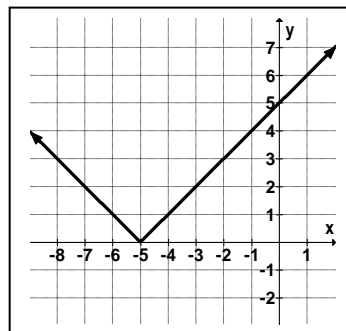   d. $f(x) = \begin{cases} 2x + 4, x < 0 \\ -2x + 4, x \ge 0 \end{cases}$

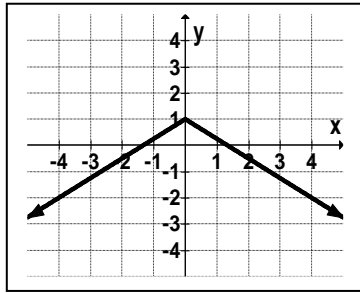3. What is an equation in point slope form for a line that passes through (9,1) and (-2,-4)?

    a. $y - 4 = \frac{5}{11}(x - 2)$
    b. $y - 1 = -\frac{3}{7}(x - 9)$
    c. $y + 4 = \frac{5}{11}(x + 2)$
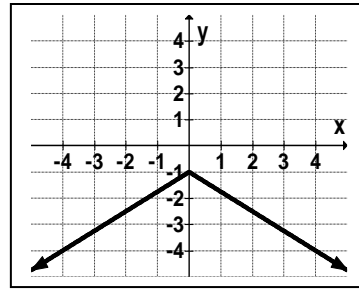   d. $y - 9 = \frac{5}{11}(x - 1)$

4. What is the equation of the graph?

    a. $y = -|x| - 5$
    b. $y = -|x - 5|$
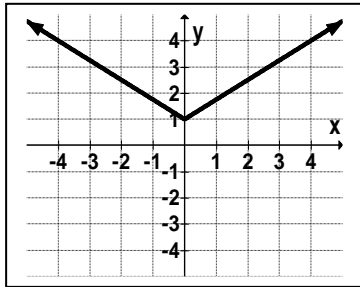   c. $y = |x + 5|$
    d. $y = |x - 5|$

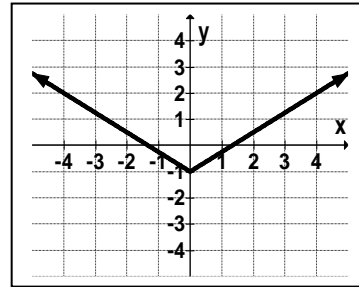5. Which graph represents the equation $y = -\frac{3}{4}|x|+1$?

a.

b.

c.
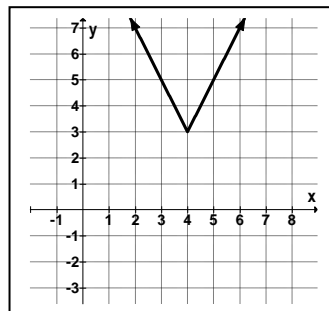

d.

6. A function contains the points (3, -1), (4, 2), (5, 4), (-2, 0), and (8,-3) what other point could the function contain?
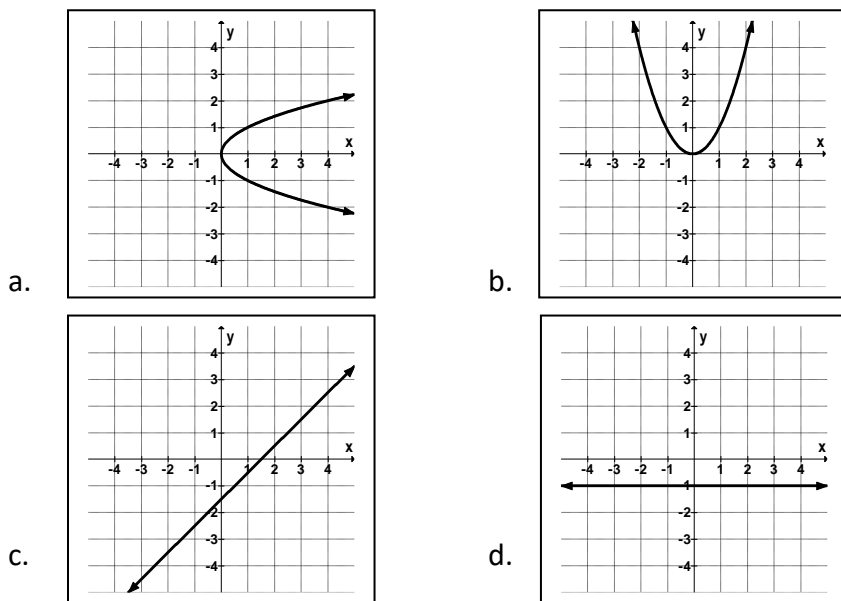
   a. (-2, -7)
   b. (3, -2)
   c. (8, 4)
   d. (2, 0)

7. Which equation has the graph shown?

   a. $y = 2(x-4)^2 + 3$
   b. $y = |x-4|+3$
   c. $y = 2|x-4|+3$
   d. $y = 2|x+4|-3$

8. Which graph is not a function?

a.

b.

c.

d.

9. Which of the following best describes the translations to obtain the graph of $y = -|x + 1| - 3$ from the graph of $y = |x|$?

    a. upside down "v", shift right one unit and down three units.
    b. upside down "v", shift left one unit and down three units.
    c. upside down "v", shift left one unit and up three units.
    d. upside down "v", shift right one unit and up three units.

10. Which model would best fit the data in the table?

    a. Linear
    b. Quadratic
    c. Cubic
    d. Absolute Value

x	f(x)
0	-2.8
1	-2.9
2	10
3	60
-1	-6.5

11. Use elimination to find the solution of the system.

$$\begin{cases} x + 2y + z = 7 \\ x + 4y + 2z = 15. \\ y - 3z = -3 \end{cases}$$

    a. $\left(1, \frac{3}{2}, 3\right)$
    b. (−1, 3, 2)
    c. (1, 3, 0)
    d. (−1, 2, 4)

12. Find a quadratic model so that f(−1) = −3, f(3) = −3, and f(1) = 5.

    a. $y = -2x^2 + 4x + 3$
    b. $y = -0.5x^2 + 3x - 4$
    c. $y = -x^2 + 4x - 2$
    d. $y = x^2 + 3x - 1$

13. For which quadratic equation is -3 the constant term?

    a. $y = (3x + 1)(-x-3)$
    b. $y = x^2 - 3x + 3$
    c. $y = (x - 3)(x - 3)$
    d. $y = -3x^2 + 3x + 9$

14. The graph of a quadratic function has a vertex of (−2, 4). What is the equation for the axis of symmetry?

    a. − 2
    b. y = 4
    c. x = −2
    d. 4

15. What is the vertex of $y = -3x^2 - 6x + 5$?

    a. (−1,14)
    b. (−3, 5)
    c. (−1, 5)
    d. (−1, 8)

16. What is the y-intercept of $y = (x + 2)^2 - 4$?

    a. $(0, -4)$
    b. $(0, 0)$
    c. $(-4, 0)$
    d. $(0, -2)$

17. Find the equation for the axis of symmetry for $y = (x - 4)^2 + 2$

    a. 2
    b. -4
    c. $x = -4$
    d. $x = 4$

18. Find the equation that translates $y = -3(x + 2)^2 - 4$, 6 units left and 5 units up.

    a. $y = -3(x + 8)^2 + 1$
    b. $y = -3(x - 4)^2 + 1$
    c. $y = 3(x + 8)^2 - 4$
    d. $y = -3(x + 7)^2 - 10$

19. Find the equation of a quadratic function whose vertex is (−2, 4) and passes through the point (3, 1).

    a. $y = -\frac{3}{25}(x - 2)^2 + 4$
    b. $y = -\frac{3}{25}(x + 2)^2 + 4$
    c. $y = 3(x + 2)^2 + 4$
    d. $y = -3(x - 2)^2 + 4$

20. The equation $8x^2 - 8x + 21 = 0$ has:

    a. one real solution
    b. 2 real, rational solutions
    c. 2 real, irrational
    d. no real solution

21. Factor the expression $12x^2y - 32xy + 15x - 40$

    a. $(2xy + 5)(6x - 16)$
    b. $y(12x^2 - 17x - 40)$
    c. $(4xy + 5)(3x - 8)$
    d. $(4xy - 5)(3x + 8)$

22. Find the factored form of the polynomial $3x^3 - 3x^2 - 18x$

    a. $3(x^2 + 2)(x - 3)$
    b. $3x(x + 2)(x - 3)$
    c. $3x(x^2 - 6x - 6)$
    d. $x(3x + 2)(x - 3)$

23. Factor. $16x^2 - 8x + 1$

    a. $(2x^2 - 2)(2x^2 - 2)$
    b. $(4x - 1)(4x - 1)$
    c. $(16x - 1)(x - 1)$
    d. $(4x^2 - 1)(2x^2 - 1)$

24. Factor the expression. $27a^3 + 8b^6$

    a. $(3a - 2b^2)(9a^2 + 6ab^2 + 4b^4)$
    b. $(3a + 2b^2)(9a^2 + 6ab^2 + 4b^4)$
    c. $(3a + 2b^2)(9a^2 - 6ab^2 + 4b^4)$
    d. $(3a + 2b^2)^3$

25. Factor the expression completely. $x^6 + 6x^3 - 16$

    a. $(x^3 + 8)(x^3 - 2)$
    b. $(x + 2)(x^2 - 2x + 4)(x^3 - 2)$
    c. $(x + 8)(x - 2)$
    d. $(x^3 + 8)(x^3 - 2)$

26. Factor. $2x^4 - 32$

    a. $2(x^2 + 4)(x^2 - 4)$
    b. $2(x^2 + 4)(x + 2)(x - 2)$
    c. $2(x^2 + 4)(x - 4)$
    d. $2(x^2 - 4)^2$

27. Factor $8x^2 + 2x - 15$

    a. $(4x + 5)(2x - 3)$
    b. $(4x - 3)(2x + 5)$
    c. $(4x + 3)(2x - 5)$
    d. $(4x - 5)(2x + 3)$

28. Find the discriminant of $x^2 - 8x - 2$.

    a. 72
    b. -72
    c. -56
    d. 56

29. Simplify $\sqrt{-50}$.

    a. $5i\sqrt{2}$
    b. $-5\sqrt{2}$
    c. $2i\sqrt{5}$
    d. $-5i\sqrt{2}$

30. Simplify i^{17}.

    a. 1
    b. -1
    c. i
    d. $-i$
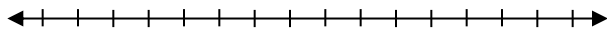
31. Solve: $-3(x - 8)^2 - 29 = 37$

     a. $8 \pm i\sqrt{22}$
     b. $-66 \pm i\sqrt{3}$
     c. $8 \pm \sqrt{22}$
     d. $66 \pm \sqrt{3}$

32. Simplify: $(5h^3 + 8h - 9) - (6h^3 + 6h - 4)$

     a. $-h^3 + 2h - 5$
     b. $-h^3 + 2h - 13$
     c. $-h^3 + 14h - 13$
     d. $-h^3 - 2h - 5$

Open-ended
33. Solve and graph the inequality $|2x - 1| < 5$. Write your answer in interval notation and set builder notation.

For questions 34 - 39, solve the inequality or equation.

34. $|2(m - 4)| + 8 \le 22$
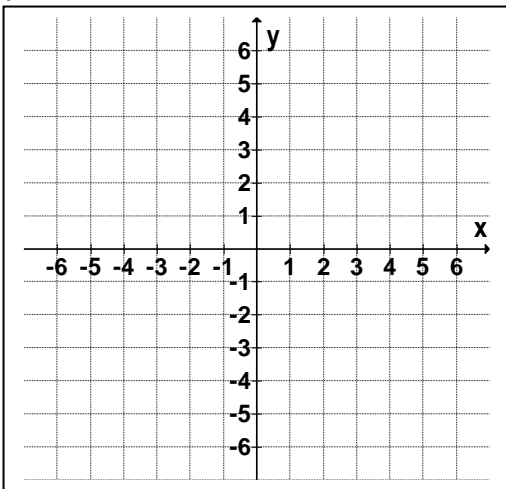
35. $|2q + 3| = 3q - 2$

36. $-4|3x + 2| = 4x + 2$

37. $-|2 + x| + 4 > 4$
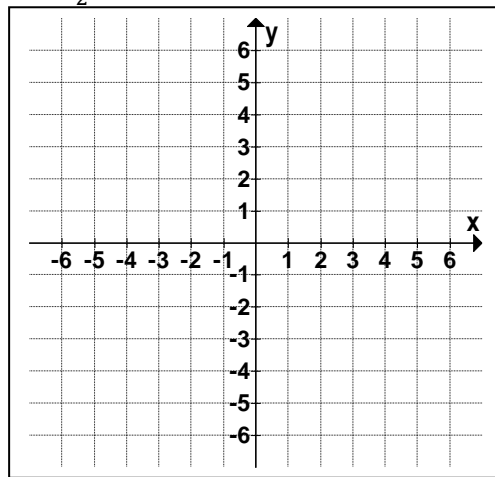
38. $\left|\dfrac{a}{6}\right| - 2 = 2$

39. $\dfrac{|5x+30|}{2} \geq -1$

For questions 40 - 41, graph the equations. Identify the axis of symmetry, vertex, domain, and range. Plot at least five points.

40. $y = -2|x + 3| + 2$

41. $y = \dfrac{1}{2}|4x - 8| - 1$

42. Solve the system of equations. $\begin{cases} b = c - a \\ -a + 2b - 7 = c \\ 3a + 3b = c + 2 \end{cases}$

43. A man throws a ball as far as he can. The table shows the height of the ball at different times.

Time (sec)	0	1	2	5	7
Height (feet)	6	12	20	35	20

    a. Find the equation of the axis of symmetry of the quadratic model of the data.

    b. Find the maximum height of the ball.

44. Describe the process of solving the system using the elimination method.
$$\begin{cases} 2x - 3y + 7z = 5 \\ x - 2y + z = 4 \\ x - 7y - z = -4 \end{cases}$$

For 45- 47, solve the equation by factoring:

45. $3x^2 + x = 2$ 46. $9x^2 + 6x + 1 = 64$ 47. $8m^2 - 5m = 0$

For 48 - 49, solve the equation by finding square roots:

48. $6r^2 = 48$ 49. $9x^2 - 25 = 0$

For 50 - 51, solve the equation by graphing on your calculator. Round to the nearest 1/100th.

50. $x^2 + 4x - 11 = 0$ 51. $3x^2 - 5x - 4 = 0$

For 52 - 53, solve the equation by completing the square.

52. $x^2 - 4x = 12$ 53. $x^2 + 7x = 14$

For 54 - 55, solve the equation by using the quadratic formula.

54. $-x^2 + 5x - 7 = 0$ 55. $6y^2 - 5y = 1$

56. Rewrite the quadratic function $y = x^2 - \dfrac{2}{5}x + \dfrac{26}{25}$ in vertex form

57. Rewrite the quadratic function $y = 7(x - 5)^2 + 2$ in standard form.

58. Explain what the discriminant tells you about the nature of the roots of a quadratic equation. Be as specific as possible. Sketch a possible graph for each type of solution.

For 59-60, create a quadratic equation with integral coefficients, given the solutions

59. x = ½, 6

60. x = $3 \pm 2i$

61. What does the discriminant of the equation $y = x^2 - 4x + 4$ tell you about the graph?

For 62 - 67, simplify:

62. $5i^9 - 9i^3$

63. $(3i + 2) + (5 - 7i)$

64. $(2 + i)(3 + 8i)$

65. $-3\sqrt{-36}$

66. $4i\sqrt{8}$

67. $(6i + 1)^2$
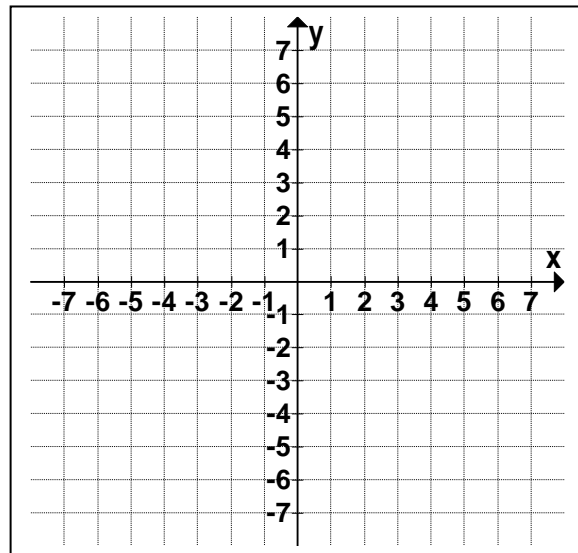
For 68 - 70, solve.

68. $x^2 + 49 = 0$

69. $2 - 3x^2 = 14$

70. $2x^2 + 80 = 0$

71. Write the equation $y = 2|x - 5| + 3$ as a piecewise function.

72. Write the equation $y = -\frac{1}{3}|x + 6|$ as a piecewise function.

73. Graph the equation $y = -\frac{1}{4}(x + 1)^2 + 7$ Identify the vertex, axis of symmetry, y-intercept, domain and range, maximum or minimum value, and at least 5 points.
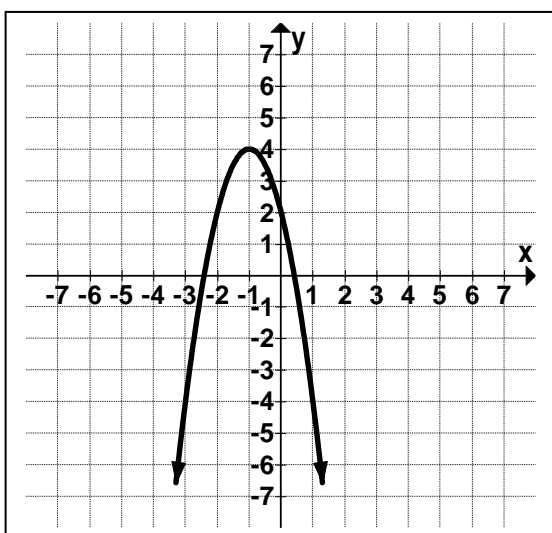

74. Graph the equation $y = 3x^2 + 12x + 4$ Identify the vertex, axis of symmetry, y-intercept, domain and range, maximum or minimum value, and at least 5 points.
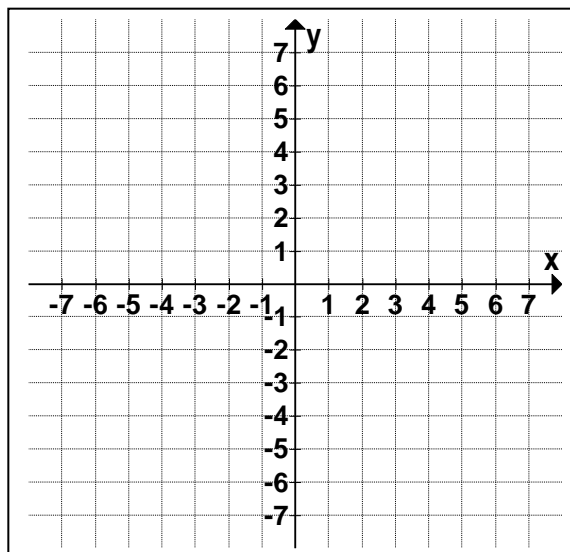
75. Identify the equation of the graph in vertex form and standard form.

76. Write the expression as a complex number in standard form. $\left(5 - \sqrt{-4}\right) - 2\left(3 + \sqrt{-1}\right)$

77. Write an example of a quartic trinomial function written in standard form that has a quadratic term with a coefficient of 3.

78. Rewrite $f(x) = (x - 5)^2(x - 2)$ in standard form. Classify the polynomial by degree and the number of terms.

79. Find the relative maximum, relative minimum, and zeros of the function
$$y = 3x^3 + 15x^2 - 12x - 60$$

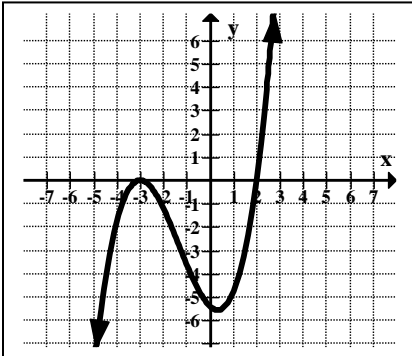80. Identify the cubic model that fits the following list of points:
$(2, 3), (-1, -3), (4, 87), (5, 171)$

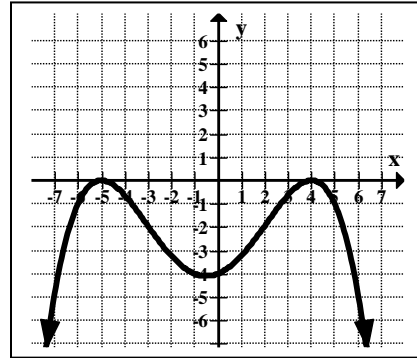81. Find the zeros of the function $y = (x + 4)(2x - 5)^3$ and state the multiplicity of multiple zeros

82. For $f(x) = x^4 + 2x^3 + x^2$ determine the zeros. State the multiplicity of any multiple zeros.

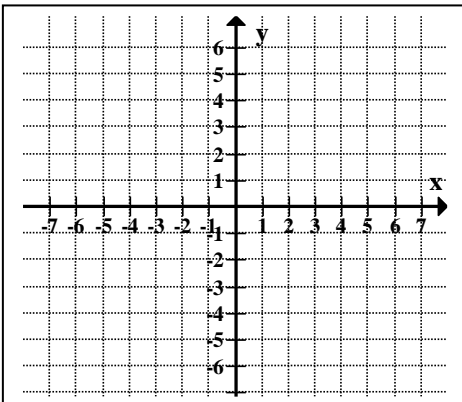*For the function in each graph, identify the zeroes and each zero's multiplicity.*

83.

84.

85. Graph the function f(x) = 2x(x² − 4).

Answer Key
<u>Multiple Choice</u>
1. A
2. C
3. C
4. C
5. A
6. D
7. C
8. A
9. B
10. C
11. B
12. A
13. A
14. C
15. D
16. B
17. D
18. A
19. B
20. D
21. C
22. B
23. B
24. C
25. B
26. B
27. D
28. A
29. A
30. C
31. A
32. A

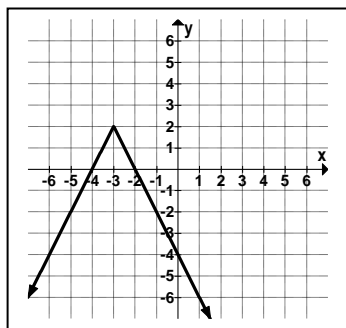Open Ended

33. $interval: (-2, -3); set: \{x: -2 < x < 3\}$ 34. $-3 \le m \le 11$

35. $extraneous: q = -1/5; solution: q = 5$
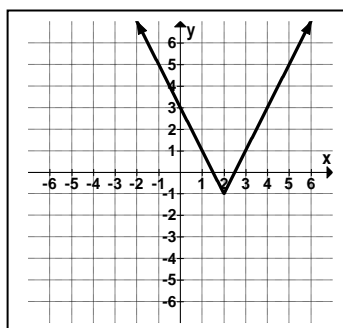
36. $x = -\frac{5}{8}, -\frac{3}{4}$ 37. No solution   38. $x = 24, -24$ 39. All real numbers

40.

41.

42. (a, b, c) = (-2, 3, 1)   43. (a) $x = 4.437$ (b) 31.241 feet

44. Answers will vary   45. $x = -1, \frac{2}{3}$ 46. $x = -3, \frac{7}{3}$ 47. $m = 0, \frac{5}{8}$

48. $r = \pm 2\sqrt{2}$ 49. $x = \pm\frac{5}{3}$ 50. $x = -5.87, 1.87$ 51. $x = -0.59, 2.26$

52. $x = 6, -2$ 53. $x = -\frac{7}{2} \pm \frac{\sqrt{105}}{2}$ 54. $x = \frac{5}{2} \pm \frac{i\sqrt{3}}{2}$ 55. $x = 1, -\frac{1}{6}$

56. $y = \left(x - \frac{1}{5}\right)^2 + 1$ 57. $y = 7x^2 - 70x + 177$ 58. Answers will vary

59. $2x^2 - 13x + 6 = 0$ 60. $x^2 - 6x + 13 = 0$
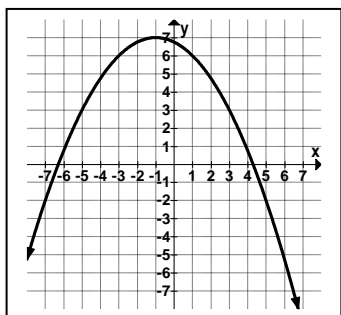
61. There is only one real, rational solution. The graph of the equation touches the x-axis at one point, the vertex.

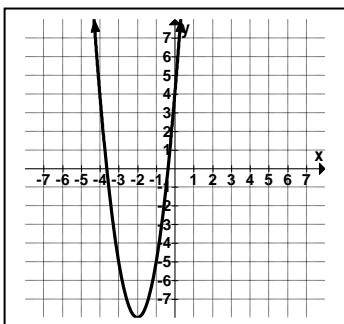62. $14i$ 63. $7 - 4i$ 64. $-2 + 19i$ 65. $-18i$ 66. $8i\sqrt{2}$

67. $-35 + 12i$ 68. $x = \pm 7i$ 69. $x = \pm 2i$ 70. $x = \pm 2i\sqrt{10}$

71. $y = \begin{cases} 2x - 7, \ x \ge 5 \\ -2x + 13, x < 5 \end{cases}$ 72. $y = \begin{cases} \frac{1}{3}x + 2, x \le -6 \\ -\frac{1}{3}x - 2, \ x > -6 \end{cases}$

73.

74.

75. $y = -2(x + 1)^2 + 4$, $y = -2x^2 - 4x + 2$ 76. $-1 - 4i$ 77. Answers will vary

78. $f(x) = x^3 - 12x^2 + 45x - 50$; degree 3 (cubic); polynomial (4 terms)

79. Max: $y = 37.79$; Min: $y = -62.24$; Zeros: $x = -5, -2, 2$

80. $y = x^3 + 3x^2 - 4x - 9$ 81. $x = \frac{5}{2}$, multiplicity of 3 and $x = -4$

82. $x = -1$, multiplicity of 2 and $x = 0$, multiplicity of 2

83. $x = -3$, multiplicity of 2 and $x = 2$, multiplicity of 1

84. $x = -5$, multiplicity of 2 and $x = 4$, multiplicity of 2

85.