1. Fill in the blank.

The general form of a (1) _____ function is $f(x) = ax^2 + bx + c$.

(1)
- quadratic
- linear
- square root

2. Fill in the blank.

The quadratic equation $ax^2 + bx + c = 0$ is written in (1) _____ form.

(1)
- standard
- point-slope
- slope-intercept

3. Fill in the blank.

If $x^2 = 7$, then $x = \sqrt{7}$ or $x = -\sqrt{7}$ because of the principle of (1) _____

(1)
- zero products.
- square roots.

4. Solve.

$x^2 = 4$

The solution is x = _____.
(Use a comma to separate answers. Type each solution only once. Express complex numbers in terms of i.)

5. Solve.

$t^2 - 75 = 0$

t = _____
(Simplify your answer. Type exact answers, using radicals as needed. Use a comma to separate answers as needed. Type each solution only once. Express complex numbers in terms of i.)

6. Solve.

$4x^2 = 28$

The solution is x = _____.
(Type exact answers, using radicals as needed. Use a comma to separate answers. Type each solution only once. Express complex numbers in terms of i.)

7. Solve.

$25x^2 - 64 = 0$

The solutions are x = _____.
(Use a comma to separate answers. Type each solution only once. Express complex numbers in terms of i.)

8. Solve.

$x^2 + 25 = 0$

The solution is x = _____.
(Simplify your answer. Use a comma to separate answers as needed. Type your answer in the form $a + bi$. Type an exact answer, using radicals as needed. Type each solution only once.)

9. Solve.

$(x-6)^2 = 9$

The solution is x = _____.
(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed. Type each solution only once. Express complex numbers in terms of i.)

10. Solve.

$(x+4)^2 = -36$

x = _____
(Use a comma to separate answers as needed. Type each solution only once. Express complex answers in terms of i.)

11. Let $f(x) = (x-9)^2$. Find x such that $f(x) = 81$.

The solutions are _____.
(Use commas to separate answers. Express complex numbers in terms of i.)

12. Complete the square to form a true equation.

$x^2 + 2x + \_\_\_ = (x + \_\_)^2$

$x^2 + 2x +$ _____ $= (x +$ _____$)^2$

13. Complete the square to form a true equation.

$x^2 - 2x + \_\_\_ = (x - \_\_)^2$

$x^2 - 2x +$ _____ $= (x -$ _____$)^2$
(Simplify your answer. Type an integer or a fraction.)

14. Complete the square to form a true equation.

$x^2 + 5x + \_\_\_ = (x + \_\_)^2$

$x^2 + 5x +$ _____ $= (x +$ _____$)^2$
(Type a simplified fraction.)

15. Complete the square to form a true equation.

$x^2 - \frac{3}{4}x + \_\_\_ = (x - \_\_)^2$

$x^2 - \frac{3}{4}x +$ _____ $= (x -$ _____$)^2$
(Type a simplified fraction.)

16. Solve by completing the square.

$x^2 + 2x = 35$

The solution is x = _____.
(Simplify your answer. Use a comma to separate answers as needed. Type each solution only once. Express complex numbers in terms of i.)

17. Solve by completing the square.

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

The solution is x = _____
(Simplify your answer. Use a comma to separate answers. Type exact answers, using radicals as needed. Type each solution only once. Express complex numbers in terms of i.)

18. Complete the square to find the x-intercepts of the function given by the equation listed.

$f(x) = x^2 + 34x + 103$

What are the x-intercepts?

_____
(Simplify your answer. Type an ordered pair. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed. Type each solution only once.)

19. Complete the square to find the x-intercepts of the function given by the equation listed.

$f(x) = x^2 - 26x - 28$

What are the x-intercepts?

_____
(Simplify your answer. Type an ordered pair. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed. Type each solution only once.)

20. Solve by completing the square.

$12x^2 + 13x = 14$

The solution is x = _____.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed. Type each solution only once.)

21. Solve by completing the square.

$3x^2 + 4x - 3 = 0$

The solution is x = _____.
(Type an exact answer, using radicals as needed. Use a comma to separate answers. Type each solution only once.)

22. The height of a building is 1790 ft. How long would it take an object to fall to the ground from the top? Use the formula $s = 16t^2$, where s is the distance, in feet, traveled by an object falling freely from rest in t seconds.

The object would fall for _____ seconds.
(Simplify your answer. Type an integer or a decimal. Round to the nearest tenth.)

23. Classify the following statement as either true or false.

The quadratic formula can be used to solve any quadratic equation.

Choose the correct answer below.

- **A.** False, because the quadratic formula cannot be used if the leading coefficient is negative.
- **B.** True, because the quadratic formula is obtained by solving the general quadratic equation $ax^2 + bx + c = 0$.
- **C.** False, because the quadratic formula cannot be used if the constant is negative.
- **D.** True, because the quadratic formula is obtained by solving the general quadratic equation $X^2 = k$.

24. Classify the following statement as either true or false.

The quadratic formula does not work if solutions are imaginary numbers.

Choose the correct answer below.

- **A.** False, because the quadratic formula does not work if solutions are real numbers.
- **B.** False, because the quadratic formula can be used to solve any quadratic equation.
- **C.** True, because the quadratic formula works only if solutions are irrrational numbers.
- **D.** True, because the quadratic formula works only if solutions are real numbers.

25. Classify the following statement as either true or false.

A quadratic equation can have as many as four solutions.

Choose the correct answer below.

- **A.** False, because a quadratic equation has at most two solutions.
- **B.** True, because the degree of the quadratic equation is four.
- **C.** False, because a quadratic equation has only one solution.
- **D.** True, because the degree of the quadratic equation is two and the number of solutions of any equation is n + 2, where n is the degree of the equation.

26. Solve.

$4x^2 - 7x - 15 = 0$

The solution(s) is/are x = _____.
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Express complex numbers in terms of i. Type each solution only once. Use a comma to separate answers as needed.)

27. Solve the equation using the quadratic formula.

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

x = _____
(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

28. Solve using the quadratic formula.

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

The solution(s) is/are x = _____.
(Type an exact answer, using radicals as needed. Express complex numbers in terms of i. Type each solution only once. Use a comma to separate answers as needed.)

29. Solve.

$$\frac{1}{x^2} - 4 = \frac{10}{x}$$

The solution(s) is/are x = _____.
(Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Express complex numbers in terms of i. Type each solution only once. Use a comma to separate answers as needed.)

30. Solve.

$x^2 + 25 = 6x$

The solution(s) is/are x = _____.
(Simplify your answer. Type an exact answer, using radicals as needed. Use integers or fractions for any numbers in the expression. Express complex numbers in terms of i. Type each solution only once. Use a comma to separate answers as needed.)

31. Solve.

$6x(x + 2) + 5 = 3x(x + 1)$

x = _____
(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed. Express complex numbers in terms of i.)

32. Let $f(x) = 2x^2 - 3x + 1$. Find x such that $f(x) = 0$.

x = _____
(Simplify your answer. Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

33. Give exact and approximate solutions to three decimal places.

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

The exact solutions are x = _____.
(Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

The approximate solutions to three decimal places are $x \approx$ _____.
(Use a comma to separate answers as needed.)

34. Match the discriminant $b^2 - 4ac = 256$ with one of the given solution descriptions.

Choose the correct answer below.

- one rational solution
- two different rational solutions
- two different irrational solutions
- two different imaginary-number solutions

35. Match the discriminant $b^2 - 4ac = -12$ with one of the given solution descriptions.

Choose the correct answer below.

- two different irrational solutions
- two different rational solutions
- one rational solution
- two different imaginary-number solutions

36. Match the discriminant $b^2 - 4ac = 15$ with one of the given solution descriptions.

Choose the correct answer below.

- two different rational solutions
- two different imaginary-number solutions
- two different irrational solutions
- one rational solution

37. For the following equation, determine what type of number the solutions are and how many solutions exist.

$x^2 + 14x + 6 = 0$

There are (1) _____ (2) _____ solution(s).

(1)
- 0
- 1
- 2

(2)
- rational
- irrational
- imaginary

38. Determine the nature of the solutions of the equation.

$x^2 + 20 = 0$

Choose the nature of the solutions of the equation.

- **A.** 1 real solution
- **B.** 2 real solutions
- **C.** 2 imaginary solutions

39. Determine what type of number the solutions are and how many solutions exist.

$5t^2 - 10t - 35 = 0$

Choose the correct number and type of solutions.

- **A.** Two irrational conjugates
- **B.** Two complex conjugates
- **C.** One rational
- **D.** Two rational

40. Use the discriminant to determine the nature of the solutions of the equation.

$9x^2 - 18x + 9 = 0$

Choose the statement which descibes the solutions of the equation.

- **A.** Two irrational solutions
- **B.** Two nonreal complex solutions
- **C.** Two rational solutions
- **D.** One rational solution

41. Write a quadratic equation in the variable x having the given numbers as solutions. Type the equation in standard form, $ax^2 + bx + c = 0$.

The solutions are $-11, 4$.

The equation is _____ $= 0$.

---

42. Write a quadratic equation having the given number as a solution.

3, only solution (Hint: It must be a repeated solution.)

The equation is _____ $= 0$.
(Type your answer in standard form.)

---

43. Write a quadratic equation having the given numbers as solutions.

-11 and -3

The quadratic equation is _____ $= 0$.
(Type your answer in standard form. Type an expression using x as a variable.)

---

44. Write a quadratic equation whose solutions are $7i$ and $-7i$.

The equation is $x^2 +$ _____ $= 0$.

---

45. Write a quadratic equation whose solutions are $3 + 7i$ and $3 - 7i$.

The equation is $x^2 -$ _____ $x +$ _____ $= 0$.

---

46. Solve the formula for the given letter. Assume all variables represent nonnegative numbers.

$a^2 + m^2 = e^2$, for a

Choose the correct value for a.

- **A.** The solution is $a = e^2 - m^2$.
- **B.** The solution is $a = \sqrt{e^2 - m^2}$.
- **C.** The solution is $a = -\sqrt{e^2 - m^2}$.
- **D.** The solution is not given.

---

47. Solve the following formula for the indicated letter. Assume that all variables represent positive numbers.

$py^2 + qy + r = 0$, for y

Choose the correct answer below.

- **A.** $y = \dfrac{-q \pm \sqrt{q^2 - 4pr}}{p}$
- **B.** $y = \dfrac{q \pm \sqrt{(-q)^2 - 4pr}}{2p}$
- **C.** $y = \dfrac{-q \pm \left[q^2 - 4pr\right]}{2p}$
- **D.** $y = \dfrac{-q \pm \sqrt{q^2 - 4pr}}{2p}$

48. Classify the following statement as either true or false.

Some equations that are not really quadratic are quadratic in form.

Choose the correct answer below.

- **A.** False, because only second-degree equations are quadratic in form.
- **B.** True, because every equation can be reducible to quadratic equation and is said to be in quadratic form.
- **C.** False, because only linear equations are quadratic in form.
- **D.** True, because some equations can be reducible to a quadratic equations and are said to be in quadratic form.

49. Classify the following statement as either true or false.

Solving an equation that is quadratic in form is not complete until the equation is solved for the original variable.

Choose the correct answer below.

- **A.** False, because an equation that is quadratic in form has no solution.
- **B.** True, because an equation is solved if the solution to an original variable is obtained.
- **C.** True, because the solution obtained for a new variable may not satisfy the original equation.
- **D.** False, because an equation is solved if the solution to a new variable is obtained in intermediate calculations.

50. Write the substitution that could be used to make the equation quadratic in u.

$5x - 7\sqrt{x} + 9 = 0$

Which substitution will make this equation quadratic?

- **A.** $u = x$
- **B.** $u = \left(\sqrt{x}\right)^2$
- **C.** $u = \sqrt{x}$
- **D.** $u = x^2$

51. What substitution could be used to make the following equation quadratic in u?

$$\left(x^2+7\right)^2+\left(x^2+7\right)-3=0$$

Choose the correct answer below.

- **A.** $u=x+7$
- **B.** $u=x^2+7$
- **C.** $u=x-7$

52. Write the substitution that could be used to make the equation quadratic in u.

$$(6+x)^4+(6+x)^2+3=0$$

Which substitution will make this equation quadratic?

- **A.** $u=x$
- **B.** $u=6+x$
- **C.** $u=(x)^2$
- **D.** $u=(6+x)^2$

53. Solve.

$$x^4-52x^2+576=0$$

Select the correct choice below and, if necessary, fill in the answer box to complete your answer.

- **A.** $x=$ _____
  (Simplify your answer. Use a comma to separate answers as needed. Express complex numbers in terms of i.)
- **B.** There is no solution.

54. Solve.

$$x^4-22x^2+96=0$$

Select the correct choice below and fill in any answer boxes in your choice.

- **A.** The solution is $x=$ _____.
  (Type exact answers, using radicals as needed. Use a comma to separate answers as needed.)
- **B.** There is no solution.

55. Solve and check.

$p - 4\sqrt{p} - 21 = 0$

Select the correct choice below and fill in any answer boxes in your choice.

- **A.** The solution is p = _____.
  (Simplify your answer. Type an integer or a fraction. Type an exact answer, using radicals as needed. Express complex numbers in terms of i. Use a comma to separate answers as needed.)
- **B.** There is no solution.

56. Solve.

$(x^2 - 2)^2 - 13(x^2 - 2) + 42 = 0$

Select the correct choice below and fill in any answer boxes in your choice.

- **A.** The solutions are _____.
  (Simplify your answer. Use integers or fractions for any numbers in the expression. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)
- **B.** There is no solution.

57. Solve the following equation.

$w^4 + 8w^2 - 9 = 0$

Select the correct choice below and fill in any answer boxes in your choice.

- **A.** w = _____
  (Express complex numbers in terms of i. Use a comma to separate answers as needed.)
- **B.** There is no solution.

58. Solve.

$x^{-2} - 2x^{-1} - 8 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution is x = _____.
  (Type an integer or a fraction. Use a comma to separate answers as needed.)
- **B.** There is no solution.

59. Solve.

$x^{2/3} - 2x^{1/3} - 24 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **A.** The solution is x = _____. (Use a comma to separate answers as needed.)
- **B.** There is no solution.

60. Determine the slope and the y-intercept. Then draw a graph.

$6 - y = 2x$

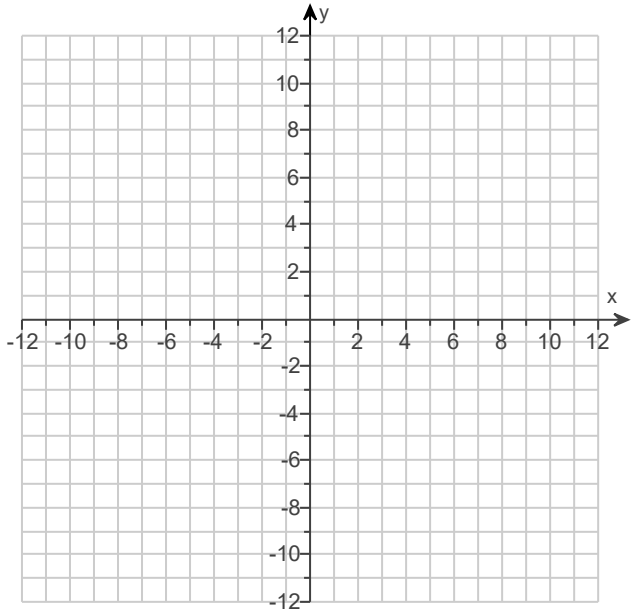
Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The slope is _____.
  (Type an integer or a simplified fraction.)
- **B.** The slope is undefined.

Select the correct choice below and fill in any answer boxes within your choice.

- **A.** The y-intercept is _____.
  (Type an ordered pair.)
- **B.** There is no y-intercept.

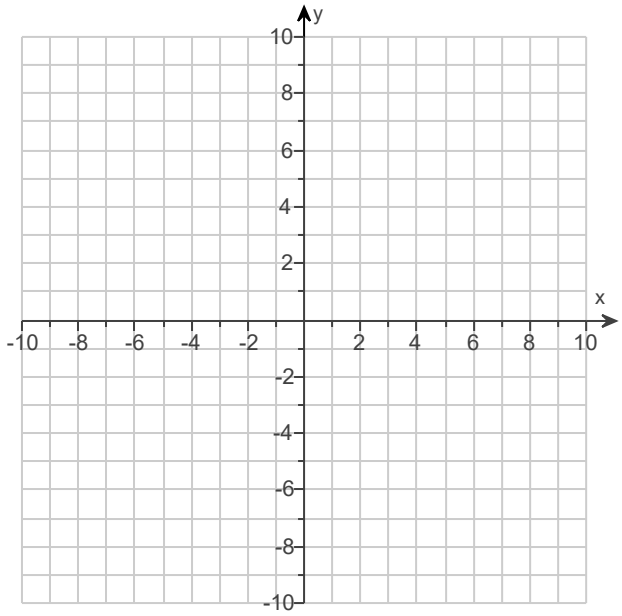
Use the graphing tool to graph the line. Use the slope and y-intercept when drawing the line.



61. Graph.

$f(x) = \frac{4}{5}x - 5$

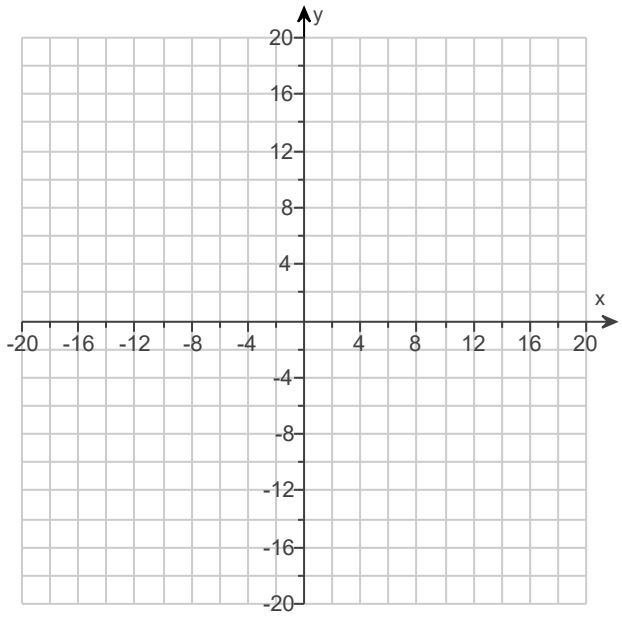
Use the graphing tool on the right to graph the equation.



62. Use the intercepts to graph the equation.

$7x - 2y = 14$

Use the graphing tool to graph the line. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.



63. Graph $y - 5 = 4(x - 2)$.

Use the graphing tool to graph the linear equation.