1. Fill in the blank with the most appropriate word or phrase.

To solve a radical equation, first (1) _____ one radical containing the variable on one side of the equation.

(1) ○ square
○ isolate

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

If $t = 6$, then $t^2 = 36$.

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

○ **A.** False, because the solution $t =$ _____ of $t = 6$ is not a solution of $t^2 = 36$.
(Type an integer or a simplified fraction.)

○ **B.** True, because each solution of $t = 6$ is also a solution of $t^2 = 36$.

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

If $x^2 = 100$, then $x = 10$.

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

○ **A.** True, because 10 is a factor of 100.

○ **B.** False, because if $x^2 = 100$, then $x =$ _____ but $x \neq 10$.

○ **C.** True, because 10 is the only integer value that when squared equals 100.

○ **D.** False, because if $x^2 = 100$, then $x = 10$ and $x =$ _____.

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4. Solve.

$\sqrt{2y + 1} = 7$

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

○ **A.** The solution is $y =$ _____.
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

○ **B.** The solution is not a real number.

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5. Solve.

$\sqrt{y + 1} - 5 = 4$

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

○ **A.** The solution is $y =$ _____.
(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

○ **B.** The solution is not a real number.

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6. Solve.

$\sqrt[3]{x+9} = 3$

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

- **A.** The solution is x = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- **B.** The solution is not a real number.

7. Solve.

$2\sqrt{x} = x$

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

- **A.** The solution is x = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers.)
- **B.** The solution is not a real number.

8. Solve.

$3y^{1/2} - 9 = 12$

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

- **A.** The solution is y = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers.)
- **B.** The solution is not a real number.

9. Solve.

$\sqrt[3]{x} = -7$

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

- **A.** The solution is x = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- **B.** The solution is not a real number.

10. Solve the following equation.

$\sqrt{x} = -2$

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

- **A.** The solution is/are _____.
  (Use a comma to separate answers as needed. Type an integer or a simplified fraction.)
- **B.** The solution is not a real number.

11. Solve.

$\sqrt{2x - 1} + 2 = x$

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

- **A.** The solution is x = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- **B.** The solution is not a real number.

12. Solve.

$\sqrt{9y + 1} = \sqrt{8y + 11}$

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

- **A.** The solution is y = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- **B.** The solution is not a real number.

13. Solve the following equation.

$\sqrt{7y + 58} = 9 + \sqrt{y - 5}$

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

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

14. Solve.

$\sqrt{x + 4} + \sqrt{3x + 16} = 2$

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

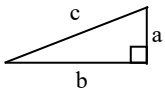
- **A.** The solution is x = _____.
  (Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)
- **B.** The solution is not a real number.

15. Fill in the blank.

In any (1) _____ triangle, the square of the length of the hypotenuse is the sum of the squares of the lengths of the legs.

(1)
- right
- isosceles
- equilateral

16. In the right triangle, find the length of the side not given. Give an exact answer and an approximation to three decimal places.



$a = 7$, $b = 8$

What is the exact value of c?

_____

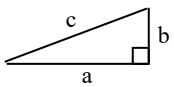
(Simplify your answer. Type an exact answer, using radicals as needed.)

What is the value of c approximated to 3 decimal places?

_____

(Round to the nearest thousandth as needed.)

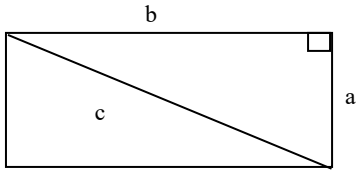
17. Find the length of side a in the right triangle, if $b = 12$ and $c = 15$. (The triangle is not drawn to scale.)



a = _____

(Simplify your answer. Type an exact answer, using radicals as needed.)

18. A soccer field is 100 yd wide and 130 yd long. Find the length of the diagonal of such a field. Give an exact answer as a radical expression and an approximation to three decimal places.



The exact length of the diagonal is _____ yards.
(Simplify your answer. Type an exact answer, using radicals as needed.)

The length of the diagonal is _____ yards.
(Round to the nearest thousandth as needed.)

19. *Television sets.* What does it mean to refer to a 20-in TV set or a 25-in TV set? Such units refer to the diagonal of the screen. A 20-in TV set also has a width of 16 inches. What is its height?

What is the height of a 20-in TV? _____ inches

20. Find the distance between the two points.

(1, − 4) and (29,92)

The distance is _____.
(Type an exact answer, using radicals as needed.)

21. Find the distance between the pair of points.

(25,16) and (− 11, − 13)

The distance is _____.
(Round to the nearest thousandth as needed.)

22. Find the midpoint of the segment with the given endpoints.

(− 3, − 3) and (− 6, − 1)

The midpoint is _____.
(Type an ordered pair.)

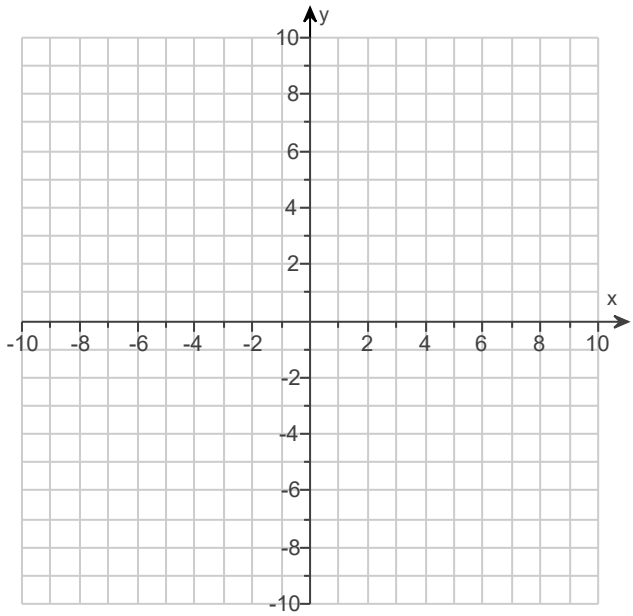
23. Determine the slope and the y-intercept of the following equation. Then draw a graph. Be sure to check.

$y = \frac{5}{2}x - 3$

The slope is _____.
(Type an integer or a simplified fraction.)

The y-intercept is _____.
(Type an ordered pair, using integers or fractions.)

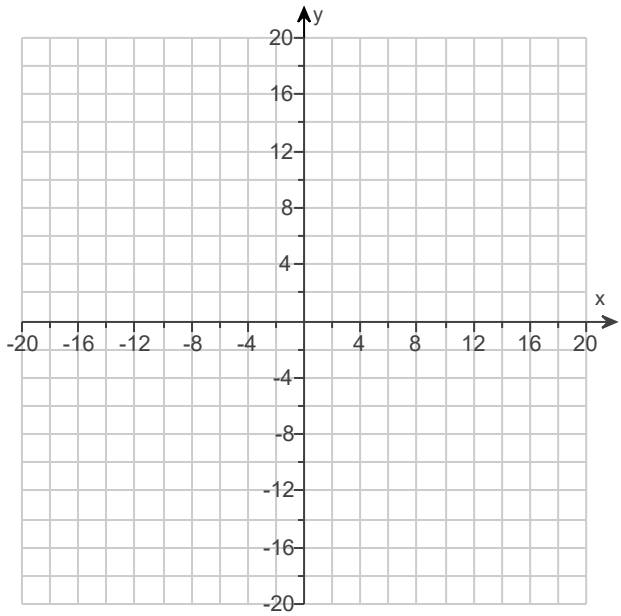
Use the graphing tool to graph the equation.



24. Use the intercepts to graph the equation.

$5x - 2y = 10$

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.



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

Every imaginary number is a complex number, but not every complex number is imaginary.

Choose the correct answer below.

- **A.** True, because the complex number of the form $0 + b\,i$ is an imaginary number, but the complex number of the form $a + 0\,i$ is not an imaginary number.
- **B.** True, because the complex number of the form $a + 0\,i$ is an imaginary number, but the complex number of the form $0 + b\,i$ is not an imaginary number.
- **C.** False, because every complex number is in the form $a + b\,i$, where $a \neq 0$.
- **D.** False, because every complex number is in the form $a + b\,i$, where $b \neq 0$.

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

Add complex numbers by combining the real parts and combining the imaginary parts.

Choose the correct answer below.

- **A.** False, because complex numbers can be added by combining only the imaginary parts.
- **B.** True, because complex numbers can be added by treating the imaginary unit i as a variable.
- **C.** True, because complex numbers can be added by treating the imaginary unit i as a number.
- **D.** False, because complex numbers can be added by combining only the real parts.

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

The square of a complex number is always a real number.

Choose the correct answer below.

- **A.** True, because the square of $a + b\,i$ is the real number $a^2 + b^2$.
- **B.** False, because the square of $a + b\,i$ is the complex number $\left(a^2 + b^2\right) - 2ab\,i$.
- **C.** True, because the square of $a + b\,i$ is the real number $a^2 - b^2$.
- **D.** False, because the square of $a + b\,i$ is the complex number $\left(a^2 - b^2\right) + 2ab\,i$.

28. Express in terms of i.

$\sqrt{-25}$

$\sqrt{-25}$ = _____
(Simplify your answer. Type your answer in the form $a + bi$.)

29. Express in terms of i.

$\sqrt{-14}$

$\sqrt{-14}$ = _____
(Simplify your answer. Type your answer in the form $a + bi$.)

30. Express in terms of i.

$\sqrt{-12}$

$\sqrt{-12}$ = _____
(Simplify your answer. Type your answer in the form $a + bi$.)

31. Add and simplify.

$(8 - 2i) + (8 - 3i)$

The answer is _____.
(Type your answer in the form a + bi.)

32. Subtract and simplify.

$(2 - 5i) - (6 - 7i)$

$(2 - 5i) - (6 - 7i) =$ _____
(Simplify your answer. Type your answer in the form a + bi.)

33. Perform the indicated operation and simplify.

$9i \cdot 8i$

$9i \cdot 8i =$ _____
(Simplify your answer. Type your answer in the form a + bi.)

34. Multiply.

$\sqrt{-16} \cdot \sqrt{-9}$

$\sqrt{-16} \cdot \sqrt{-9} =$ _____
(Simplify your answer. Type your answer in the form a + bi. Type an exact answer, using radicals as needed.)

35. Multiply.

$\sqrt{-6} \cdot \sqrt{-11}$

$\sqrt{-6} \cdot \sqrt{-11} =$ _____
(Simplify your answer. Type your answer in the form a + bi.)

36. Multiply.

$7i(9 - 9i)$

$7i(9 - 9i) =$ _____
(Simplify your answer. Type your answer in the form a + b i .)

37. Multiply.

$(7 + 4i)(6 + i)$

$(7 + 4i)(6 + i) =$ _____
(Simplify your answer. Type your answer in the form a + bi.)

38. Multiply.

$(8 + 5i)(8 - 5i)$

$(8 + 5i)(8 - 5i) =$ _____
(Type your answer in the form a + bi.)

39. Divide.

$\frac{8}{9 + i}$

$\frac{8}{9 + i} =$ _____
(Simplify your answer. Type an integer or a fraction. Type your answer in the form a + bi.)

40. Perform the indicated operation and simplify. Write the answer in the form a + b i.

$$\frac{7}{7-2i}$$

$\frac{7}{7-2i}$ = _____

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

41. Divide.

$$\frac{3-6i}{12i}$$

$\frac{3-6i}{12i}$ = _____

(Simplify your answer. Type an integer or a fraction. Type your answer in the form a + bi.)

42. Divide and simplify to the form a + bi.

$$\frac{8+3i}{3-i}$$

$\frac{8+3i}{3-i}$ = _____

(Type a and b as fractions.)

43. Simplify.

i^{16}

i^{16} = _____

44. Simplify.

i^{27}

i^{27} = _____

45. Simplify.

i^{50}

i^{50} = _____

46. Simplify.

i^{29}

i^{29} = _____

(Simplify your answer. Type your answer in the form a + bi.)

47. Factor.

$w^2 - 25$

$w^2 - 25 =$ _____
(Factor completely.)

48. Factor.

$6s + s^2 - 27$

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

- **A.** $6s + s^2 - 27 =$ _____
  (Factor completely.)
- **B.** The polynomial is prime.