1. Solve. Check your solution.

\[ x + 3 = 12 \]

The solution is \( x = \) \underline{9}.

Answer: 9

2. Solve. Check your solution.

\[ d - 1 = -12 \]

The solution is \( d = \) \underline{-11}.

Answer: -11

3. Solve.

\[ -8z = 24 \]

The solution is \( z = \) \underline{-3}.

Answer: -3

4. Solve the equation.

\[ 5n + 40 = 55 \]

\[ n = \] \underline{3}.

Answer: 3

5. Solve the equation.

\[ -3y - 11 = 6y + 34 \]

\[ y = \] \underline{-5}.

Answer: -5
6. Solve the inequality. Graph the solution set and write it in interval notation.

\[ 4x < -24 \]

Choose the correct graph below.

The solution to the inequality \( 4x < -24 \) is \((\infty, -6)\).

Answers

C. \((\infty, -6)\)

7. Solve the inequality. Graph the solution set and write it in interval notation.

\[ -4x \leq 12 \]

Choose the correct graph below.

The solution to the inequality \(-4x \leq 12\) is \([-3, \infty)\).

Answers

B. \([-3, \infty)\)
8. The perimeter of a rectangle is to be no greater than 100 centimeters and the width must be 10 centimeters. Find the maximum length of the rectangle.

\[ \text{The maximum length of the rectangle is } 10 \text{ cm.} \]

(1) cm.
For the following equation, find three ordered pair solutions by completing the table. Then use the ordered pairs to graph the equation.

\[ y = -3x + 4 \]

Find three ordered pair solutions of the given equation.

<table>
<thead>
<tr>
<th>x</th>
<th>y</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Use the graphing tool to graph the line.

Answers 4

1

-2
10. Find the slope of the line that goes through the given points. 
   \(-2, -5\) and \((-3, -9)\)

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

- A. The slope is \[\text{_____} \] . (Type an integer or a simplified fraction.)
- B. The slope is undefined.

Answer: A. The slope is 4. (Type an integer or a simplified fraction.)

11. Solve the following equation for y.
   \[y - 3 = -5(x - (-7))\]

   \[y = \text{_____} \] (Simplify your answer.)

   Answer: \(-5x - 32\)

12. Find the slope-intercept form of the line whose slope is 2 and that passes through the point \((-5, 11)\).

   The equation of the line is \[\text{_____} \].
   (Type your answer in slope-intercept form.)

   Answer: \(y = 2x + 21\)

13. Find the value of \(x^2 - 4x + 3\) for the given value of \(x\).

   \[x = -3\]

   The value of the polynomial for \(x = -3\) is \[\text{_____} \]. (Simplify your answer.)

   Answer: 24

14. Given the following function, find \(f(-5)\), \(f(0)\), and \(f(3)\).

   \[f(x) = x + 4\]

   \[f(-5) = \text{_____} \]

   \[f(0) = \text{_____} \]

   \[f(3) = \text{_____} \]

   Answers -1
   4
   7
15. Solve the system of equations by the addition method.

\[
\begin{align*}
3x + y &= 15 \\
4x - y &= 13
\end{align*}
\]

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

- A. The solution is \((4,3)\). (Simplify your answer. Type an ordered pair.)
- B. There are infinitely many solutions; \((x,y)\) satisfy \(3x + y = 15\) or \(4x - y = 13\).
- C. There is no solution; \(\emptyset\) or \((x,y)\).

Answer: A. The solution is \((4,3)\). (Simplify your answer. Type an ordered pair.)

16. If \(P(x) = x^2 + x + 4\), find \(P(8)\).

\[
P(8) = \left. x^2 + x + 4 \right|_{x=8}
\]

Answer: 76

17. Simplify the following expression by combining the like terms.

\[
9a^2 - 3ab + 2b^2 - 5a^2 - 5ab + 3b^2
\]

\[
9a^2 - 3ab + 2b^2 - 5a^2 - 5ab + 3b^2 = \left. \right|_{a=4, b=2}
\]

Answer: \(4a^2 - 8ab + 5b^2\)

18. Subtract.

\[
(5y^2 + 9y - 9) - (-5y + 2)
\]

\[
(5y^2 + 9y - 9) - (-5y + 2) = \left. \right|_{y=1}
\]

Answer: \(5y^2 + 14y - 11\)

19. Add.

\[
(-8y^2 - 7y) + (7y^2 + y - 9)
\]

\[
(-8y^2 - 7y) + (7y^2 + y - 9) = \left. \right|_{y=-2}
\]

Answer: \(-y^2 - 6y - 9\)
20. Multiply.

\((a + 3)(a − 7)\)

\((a + 3)(a − 7) = \) 

Answer: \(a^2 − 4a − 21\)

21. Find the following product.

\((9y − 1)^2\)

\((9y − 1)^2 = \) 

Answer: \(81y^2 − 18y + 1\)

22. Multiply.

\((3x + 7)(3x + 2)\)

\((3x + 7)(3x + 2) = \) (Simplify your answer.)

Answer: \(9x^2 + 27x + 14\)

23. Find the following product.

\((9a + 6)(2a^2 + 7a + 3)\)

\((9a + 6)(2a^2 + 7a + 3) = \) 

Answer: \(18a^3 + 75a^2 + 69a + 18\)

24. Multiply.

\((a − 10)(a + 10)\)

\((a − 10)(a + 10) = \) (Simplify your answer.)

Answer: \(a^2 − 100\)
25. Factor out the greatest common factor from the polynomial.

\[5x + 25\]

\[5x + 25 = \underline{5(x + 5)}\] (Type your answer in factored form.)

Answer: \(5(x + 5)\)

26. Factor the trinomial completely.

\[x^2 - 11x + 28\]

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

- **A.** \(x^2 - 11x + 28 = \underline{(x - 4)(x - 7)}\) (Type your answer in factored form.)
- **B.** The polynomial is prime.

Answer: A. \(x^2 - 11x + 28 = (x - 4)(x - 7)\) (Type your answer in factored form.)

27. Factor the trinomial completely.

\[x^2 - 3x - 10\]

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

- **A.** \(x^2 - 3x - 10 = \underline{(x + 2)(x - 5)}\) (Type your answer in factored form.)
- **B.** The polynomial is prime.

Answer: A. \(x^2 - 3x - 10 = (x + 2)(x - 5)\) (Type your answer in factored form.)

28. Factor the following binomial completely.

\[121x^2 - 49y^2\]

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

- **A.** \(121x^2 - 49y^2 = \underline{(11x + 7y)(11x - 7y)}\) (Factor completely.)
- **B.** The polynomial is prime.

Answer: A. \(121x^2 - 49y^2 = (11x + 7y)(11x - 7y)\) (Factor completely.)
29. Solve the equation.

\[(x - 6)(x + 4) = 0\]

\[x = \underline{6, -4}\]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 6, − 4

30. Solve the equation.

\[6x(x - 7) = 0\]

\[x = \underline{7, 0}\]

(Use a comma to separate answers as needed.)

Answer: 7,0

31. Solve the equation.

\[(8x + 9)(5x - 6) = 0\]

\[x = \underline{-\frac{9}{8}, \frac{6}{8}}\]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: \(-\frac{9}{8}, \frac{6}{8}\)

32. Solve the equation.

\[x^2 - 12x + 35 = 0\]

\[x = \underline{7, 5}\]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 7,5

33. Solve.

\[x^2 + 2x - 35 = 0\]

\[x = \underline{-7, 5}\]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: − 7,5
34. Solve.

\[ x^2 - 7x = 0 \]

\[ x = \] 0, 7

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 0, 7

35. Solve the equation.

\[ x^3 - 12x^2 + 27x = 0 \]

\[ x = \] 0, 3, 9

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 0, 3, 9

36. Solve.

\[ 3x^2 - 7x - 6 = 0 \]

\[ x = \] \( \frac{2}{3}, 3 \)

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: \( \frac{2}{3}, 3 \)

37. Solve.

\[ x^2 + 6x + 9 = 0 \]

\[ x = \] -3

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: -3

38. Solve.

\[ 9x^3 - 36x = 0 \]

\[ x = \] 0, -2, 2

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 0, -2, 2
39. The area of the square is 121 square units. Find the length of its sides.

\[ x \]

\[ x = \quad \text{units} \]

Answer: 11

40. Solve the absolute value equation.

\[ |2x - 1| = 3 \]

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

- A. The solution set is \( \{ \quad \} \).

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

- B. The solution set is \( \emptyset \).

Answer: A. The solution set is \( \{ 2, -1 \} \).

(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
41. Solve the inequality. Then graph the solution set.

\[ |x + 5| < 5 \]

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

- **A.** The solution is one or more intervals. The solution is \((-1, 0)\).
  (Simplify your answer. Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)

- **B.** There are only one or two solutions. The solution set is \{ \}.
  (Type an integer or a fraction. Use a comma to separate answers as needed.)

- **C.** There is no solution.

Choose the correct graph below.

- **A.**

- **B.**

- **C.**

- **D.**

- **E.**

- **F.**

Answers A. The solution is one or more intervals. The solution is \((-1, 0)\).
(Simplify your answer. Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)
42. Solve the inequality. Graph the solution set.

\[ |x + 5| \geq 13 \]

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

- A. The solution is one or more intervals. The solution is __________.
  (Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. There are only one or two solutions. The solution set is {__________}.  
  (Use a comma to separate answers as needed.)
- C. There is no solution.

Choose the correct graph below.

- A.
- C.
- E.
- B.
- D.
- F.

Answers

A. The solution is one or more intervals. The solution is \((-\infty, -18] \cup [8, \infty)\).
  (Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)

43. Simplify the radical. Assume that all variables represent positive real numbers.

\[ \sqrt{36a^8b^{28}} \]

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

- A. \(\sqrt{36a^8b^{28}} = \) __________
- B. The square root is not a real number.

Answer: A. \(\sqrt{36a^8b^{28}} = 6a^4b^{14} \)
44. Solve.

\[ \sqrt{x - 2} = 4 \]

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

- **A.** The solution(s) is(are) \( x = \) _______.
  (Use a comma to separate answers as needed.)
  **Answer:** A. The solution(s) is(are) \( x = 18 \). (Use a comma to separate answers as needed.)

- **B.** The solution set is \( \emptyset \).

45. Use the square root property to solve the equation. The equation has real number solutions.

\[ (x + 8)^2 = 36 \]

\( x = \) _______.

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

**Answer:** \(-2, -14\)

46. Use the quadratic formula to solve the equation.

\[ m^2 - 3m - 10 = 0 \]

\( m = \) _______.

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

**Answer:** \(5, -2\)

47. Use the quadratic formula to solve the equation.

\[ x^2 + 2x + 5 = 0 \]

The solution(s) is/are \( x = \) _______.

(Simplify your answer. Type an exact answer, using radicals and \( i \) as needed. Use a comma to separate answers as needed.)

**Answer:** \(-1 + 2i, -1 - 2i\)
48. Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

\[ f(x) = x^2 - 7 \]

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

The vertex is \( (0, -7) \).

The axis of symmetry is \( x = 0 \).

49. Find the vertex of the graph of the following quadratic function.

\[ f(x) = -x^2 + 6x - 5 \]

The vertex is \( (3, 4) \). (Type an ordered pair.)

Answer: \( (3, 4) \)