| **Student:** _____ | **Instructor:** Alfredo Alvarez | **Assignment:** |
| **Date:** _____ | **Course:** Math 0410 / 0320 Alvarez | MATHRISINGSCHOLARH049e |

1. Solve. Check your solution.

   $x + 3 = 12$

   The solution is x = [   ].

   Answer: 9

2. Solve. Check your solution.

   $d - 1 = -12$

   The solution is d = [   ].

   Answer: −11

3. Solve.

   $-8z = 24$

   The solution is z = [   ].

   Answer: −3

4. Solve the equation.

   $5n + 40 = 55$

   n = [   ]

   Answer: 3

5. Solve the equation.

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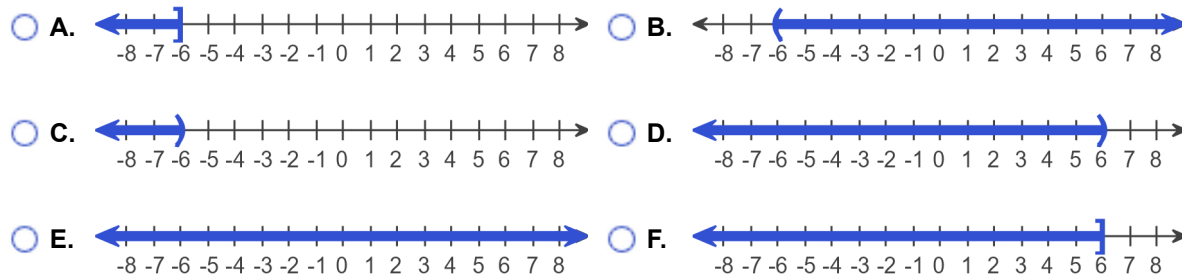
   y = [   ]

   Answer: −5

6. Solve the inequality. Graph the solution set and write it in interval notation.
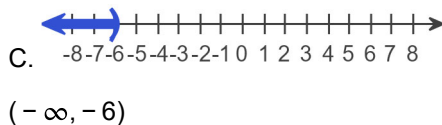
    $4x < -24$

Choose the correct graph below.

○ **A.**

○ **B.**

○ **C.**

○ **D.**

○ **E.**

○ **F.**

The solution to the inequality $4x < -24$ is ▭ .
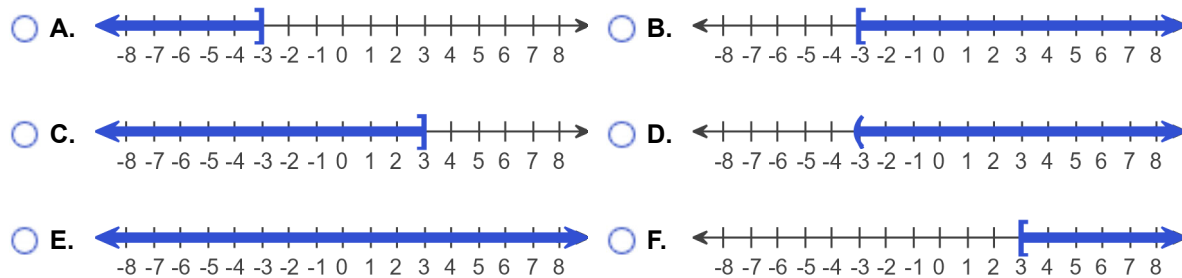   (Type your answer in interval notation.)

Answers

   C.

   $(-\infty, -6)$

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

    $-4x \le 12$

Choose the correct graph below.

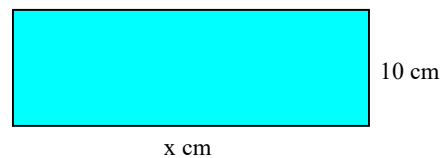○ **A.**

○ **B.**

○ **C.**

○ **D.**

○ **E.**

○ **F.**

The solution to the inequality $-4x \le 12$ is ▭ .
    (Type your answer in interval notation.)

Answers

   B.

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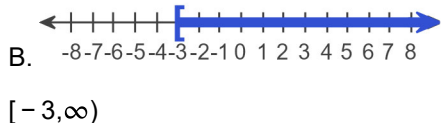
8. The perimeter of a rectangle is to be no greater than 100 centimeters and the width must be 10 centimeters. Find the maximum length of the rectangle.

10 cm

x cm

The maximum length of the rectangle is [   ] (1) [   ]
(Type an integer.)

(1) ○ cm^3.
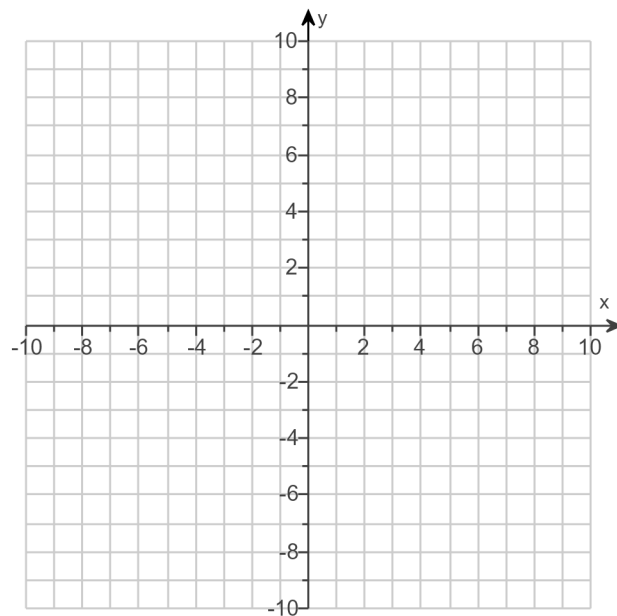   ○ cm^2.
     ○ cm.

Answers 40

   (1) cm.

9.

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.

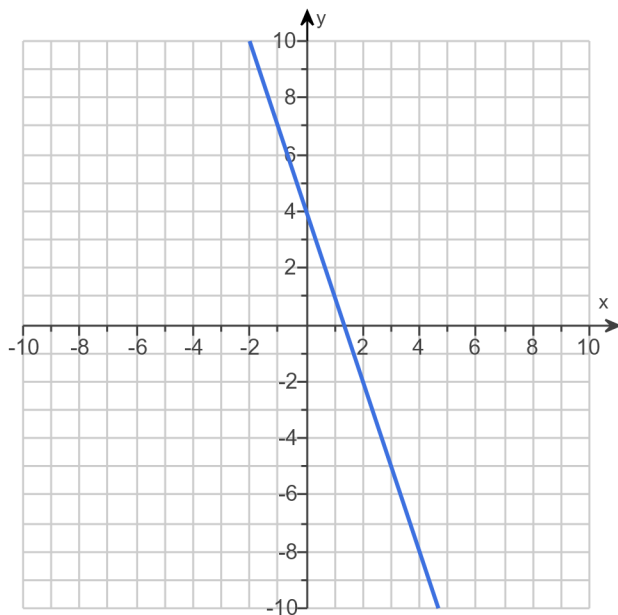| x	y
0	
1	
2	

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 _____ . (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 = [ ] (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 [ ] .
(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 [ ] . (Simplify your answer.)

Answer: 24

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

$f(x) = x + 4$

$f(-5) = $ [ ]

$f(0) = $ [ ]

$f(3) = $ [ ]

Answers -1

     4

     7

15. Solve the system of equations by the addition method.

$$\begin{cases} 3x + y = 15 \\ 4x - y = 13 \end{cases}$$

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

○ **A.** The solution is _____ . (Simplify your answer. Type an ordered pair.)

○ **B.** There are infinitely many solutions; $\{(x,y)|3x + y = 15\}$ or $\{(x,y)|4x - y = 13\}$.

○ **C.** There is no solution; $\{\}$ or $\varnothing$.

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

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

$P(8) =$ [ ]

Answer: 76

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

$$9a^2 - 3ab + 2b^2 - 5a^2 - 5ab + 3b^2$$

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

Answer: $4a^2 - 8ab + 5b^2$

18. Subtract.

$$\left(5y^2 + 9y - 9\right) - (-5y + 2)$$

$\left(5y^2 + 9y - 9\right) - (-5y + 2) =$ [ ] (Simplify your answer.)

Answer: $5y^2 + 14y - 11$

19. Add.

$$\left(-8y^2 - 7y\right) + \left(7y^2 + y - 9\right)$$

$\left(-8y^2 - 7y\right) + \left(7y^2 + y - 9\right) =$ [ ] (Do not factor.)

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.

$(9a + 6)\left(2a^2 + 7a + 3\right)$

$(9a + 6)\left(2a^2 + 7a + 3\right) = $ [_____]

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.

    $5x + 25$

    $5x + 25 =$ ☐ (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.** $x^2 - 11x + 28 =$ _____ (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.** $x^2 - 3x - 10 =$ _____ (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.** $121x^2 - 49y^2 =$ _____ (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 = [ ]
    (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 = [ ] (Use a comma to separate answers as needed.)

    Answer: $7,0$

31. Solve the equation.

    $(8x + 9)(5x - 6) = 0$

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

    Answer: $-\dfrac{9}{8}, \dfrac{6}{5}$

32. Solve the equation.

    $x^2 - 12x + 35 = 0$

    x = [ ]
    (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 = [ ]
    (Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)
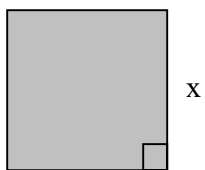
    Answer: $-7,5$

34. Solve.

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

x = [   ]

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

Answer: 0,7

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35. Solve the equation.

$$x^3 - 12x^2 + 27x = 0$$

x = [   ]

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

Answer: 0,3,9

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36. Solve.

$$3x^2 - 7x - 6 = 0$$

x = [   ]

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

Answer: $-\dfrac{2}{3}, 3$

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37. Solve.

$$x^2 + 6x + 9 = 0$$

x = [   ]

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

Answer: -3

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38. Solve.

$$9x^3 - 36x = 0$$

x = [   ]

(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 = [   ] 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 $\{$ [   ] $\}$.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

○ **B.** The solution set is ∅.

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.

$$|x + 5| < 5$$

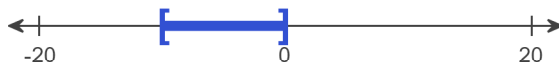Select the correct choice below and, if necessary, fill in the answer box within your choice.

- **A.** The solution is one or more intervals. The solution is _____ .
  (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.)
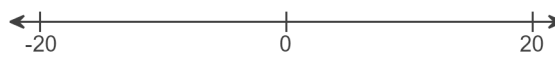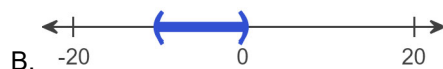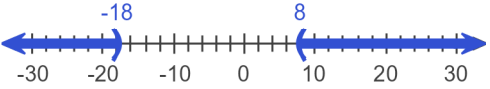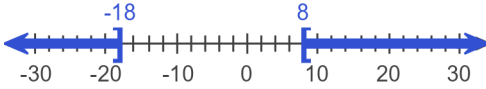- **C.** There is no solution.

Choose the correct graph below.

A.

B.

C.

D.

E.

F.

Answers A. The solution is one or more intervals. The solution is **(− 10,0)** .
(Simplify your answer. Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)
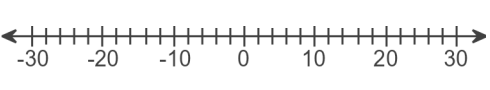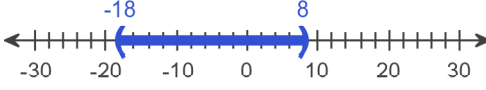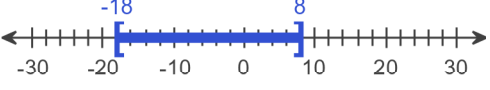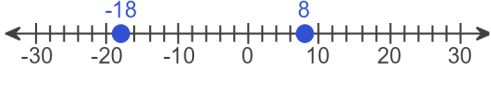

B.
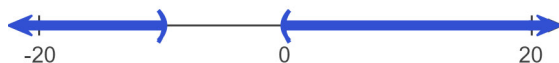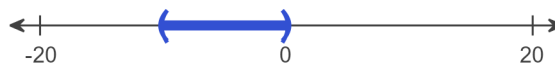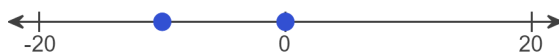
42. Solve the inequality. Graph the solution set.

$$|x + 5| \geq 13$$

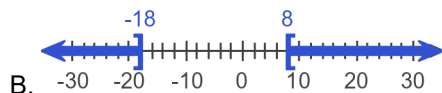Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- **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.**
- **B.**
- **C.**
- **D.**
- **E.**
- **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.)

B.

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

$$\sqrt{36a^8 b^{28}}$$

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

- **A.** $\sqrt{36a^8 b^{28}} = $ _____
- **B.** The square root is not a real number.

Answer: A. $\sqrt{36a^8 b^{28}} = \boxed{6a^4 b^{14}}$

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.)
    ○ **B.** The solution set is ∅.

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

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.
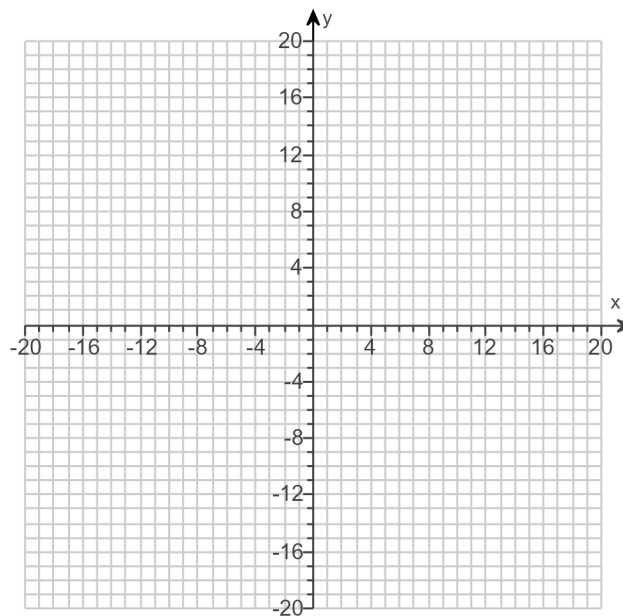
$f(x) = x^2 - 7$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.
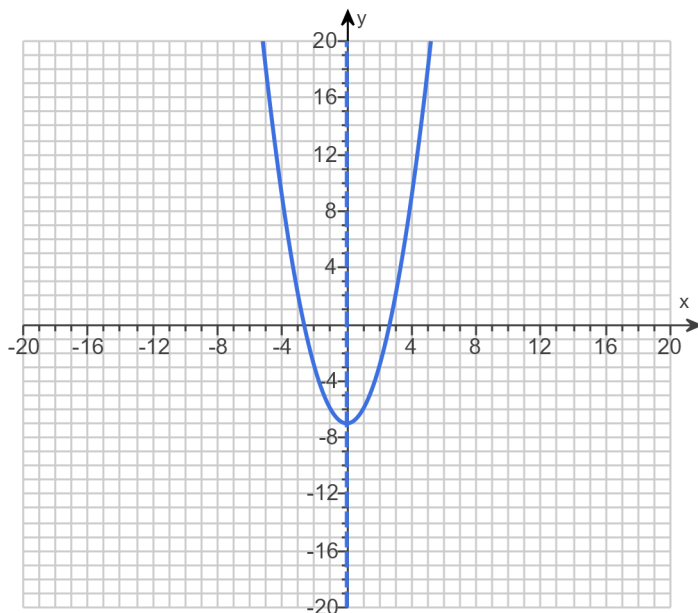
The vertex is ⬚.
(Type an ordered pair.)

The axis of symmetry is ⬚.
(Type an equation.)

Answers

$(0, -7)$

$x = 0$

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

$f(x) = -x^2 + 6x - 5$

The vertex is ⬚. (Type an ordered pair.)

Answer: (3,4)