

1. Determine which of the following values of x is a solution to the equation $6 + \frac{1}{x+5} = 7$.

A) $x = -4$ B) $x = -\frac{2}{3}$ C) $x = -5$ D) $x = 6$ E) $x = 4$

Ans: A

Learning Objective: Identify solutions of an equation

Section: 2.1

2. Determine which of the following values of x is a solution to the equation $x^2 + 9x + 18 = 0$.

A) $x = 6, x = -3$

D) $x = -6, x = 3$

B) $x = -6$

E) $x = 3$

C) $x = -6, x = -3$

Ans: C

Learning Objective: Identify solutions of an equation

Section: 2.1

3. Which of the following equations is not a conditional equation?

A) $3(x+7) = 10x + 49$

D) $x^2 + 6x + 9 = (x+3)^2 + 4x$

B) $3(x+7) = 3x + 7$

E) $x^2 + 3(7x-3) = x^2 + 21x - 9$

C) $x^2 + 10x + 21 = (x+3)(x+7) + 3$

Ans: E

Learning Objective: Identify if an equation is an identity or a conditional equation

Section: 2.1

4. Which of the following equations is not an identity equation?

A) $3 + \frac{1}{x+1} = \frac{3x+4}{x+1}$

D) $\frac{3}{x} + \frac{9}{x} = \frac{12x}{x^2}$

B) $3(x+9) = 3x + 9$

E) $x^2 + 3(9x-3) = x^2 + 27x - 9$

C) $-(3-x) = x-3$

Ans: B

Learning Objective: Identify if an equation is an identity or a conditional equation

Section: 2.1

5. Solve: $-5(x-5) = 7(2-x) - 2$

A) $x = -\frac{17}{4}$ B) $x = -\frac{37}{12}$ C) $x = \frac{13}{4}$ D) $x = \frac{37}{2}$ E) $x = -\frac{13}{2}$

Ans: E

Learning Objective: Solve equation

Section: 2.1

6. Solve: $\frac{x}{11} - \frac{x}{2} = 7 + \frac{7x}{22}$
 A) $x = -\frac{77}{8}$ B) $x = -\frac{22}{9}$ C) $x = -22$ D) $x = -\frac{9}{22}$ E) $x = \frac{77}{3}$

Ans: A

Learning Objective: Solve equation

Section: 2.1

7. Solve: $-\frac{5}{3x+1} - \frac{24x}{3x-1} = -8$
 A) $x = -\frac{1}{13}$ B) $x = -\frac{1}{3}$ C) $x = -\frac{13}{3}$ D) $x = \frac{1}{3}$ E) $x = -\frac{3}{29}$

Ans: A

Learning Objective: Solve equation

Section: 2.1

8. Solve: $\frac{1}{x+6} + \frac{2}{x+2} = \frac{3}{x^2+8x+12}$
 A) $x = -\frac{5}{3}$ B) $x = \frac{8}{3}$ C) $x = \frac{7}{3}$ D) $x = -\frac{11}{3}$ E) $x = \frac{1}{3}$

Ans: D

Learning Objective: Solve equation

Section: 2.1

9. Solve for x : $-\frac{10}{3}x - ax = 5\left(-\frac{2}{3}x - 1\right) + b$
 A) $x = \frac{5-a}{b}$ B) $x = \frac{b-5}{a}$ C) $x = \frac{5-b}{a}$ D) $x = \frac{a-b}{5}$ E) $x = \frac{b-a}{5}$

Ans: C

Learning Objective: Solve equation for the indicated variable

Section: 2.1

10. Find the x - and y -intercepts of the graph of the equation $-\frac{5x}{4} + 1 + 9y = 0$.

A) x -intercept: $\left(-\frac{4}{5}, 0\right)$; y -intercept: $\left(0, \frac{1}{9}\right)$

B) x -intercept: $\left(\frac{5}{4}, 0\right)$; y -intercept: $\left(0, \frac{5}{3}\right)$

C) x -intercept: $\left(-\frac{5}{4}, 0\right)$; y -intercept: $\left(0, \frac{2}{3}\right)$

D) x -intercept: $\left(\frac{4}{5}, 0\right)$; y -intercept: $\left(0, -\frac{1}{9}\right)$

E) x -intercept: $\left(\frac{2}{3}, 0\right)$; y -intercept: $\left(0, -\frac{4}{5}\right)$

Ans: D

Learning Objective: Solve for x - and y - intercepts

Section: 2.2

11. Which of the following is a zero of the given function?

$$f(x) = \frac{x+3}{7} - \frac{x+3}{5} + 7$$

$$x = \frac{281}{2}, x = -\frac{251}{2}, x = \frac{239}{12}, x = \frac{239}{2}$$

A) $x = \frac{281}{2}$ B) $x = -\frac{251}{2}$ C) $x = \frac{239}{12}$ D) $x = \frac{239}{2}$ E) none of these

Ans: D

Learning Objective: Identify zeros of a function

Section: 2.2

12. Which of the following is a zero of the given function?

$$f(x) = x + 1 - \frac{6}{x}$$

$$x = -2, x = -3, x = -5, x = 1$$

A) $x = -2$ B) $x = -3$ C) $x = -5$ D) $x = 1$ E) none of these

Ans: B

Learning Objective: Identify zeros of a function

Section: 2.2

13. Solve the following equation.

$$10(x+4) = -8(x+7) + 78$$

A) $x = \frac{9}{2}$ B) $x = \frac{31}{9}$ C) $x = -1$ D) $x = -4$ E) $x = \frac{29}{3}$

Ans: C

Learning Objective: Solve a linear equation

Section: 2.2

14. Solve for
- x
- , rounding your answer to the nearest thousandth.

$$2.865 + 1.204(4.193x + 3.546) = 5.458x - 3$$

A) 10.093 B) 24.740 C) 10.752 D) -0.965 E) 0.419

Ans: B

Learning Objective: Solve equation

Section: 2.2

15. Solve the following equation.

$$\frac{x+9}{2} = \frac{x-7}{8}$$

A) $x = -\frac{8}{3}$ B) $x = -\frac{79}{10}$ C) $x = -\frac{23}{6}$ D) $x = -\frac{43}{3}$ E) $x = \frac{29}{5}$

Ans: D

Learning Objective: Solve a linear equation

Section: 2.2

16. Solve the following equation.

$$\frac{x+1}{4} - \frac{x-7}{7} = 4$$

A) $x = \frac{133}{3}$ B) $x = \frac{104}{11}$ C) $x = -\frac{31}{3}$ D) $x = -\frac{31}{11}$ E) $x = \frac{77}{3}$

Ans: E

Learning Objective: Solve a linear equation

Section: 2.2

17. Solve the following equation.

$$(x+6)^2 + 16(x+16) = (x+6)(x+16)$$

A) $x = -\frac{98}{3}$ B) $x = -22$ C) $x = \frac{158}{3}$ D) $x = -\frac{49}{4}$ E) $x = -\frac{31}{4}$

Ans: A

Learning Objective: Solve equation

Section: 2.2

18. Determine any point(s) of intersection between the following equations.

$$y = 2 - x$$

$$y = \frac{5}{4} - \frac{11}{4}x$$

- A) $\left(-\frac{1}{5}, \frac{17}{15}\right)$ B) $\left(\frac{3}{7}, \frac{11}{7}\right)$ C) $\left(-\frac{3}{7}, \frac{17}{7}\right)$ D) $\left(\frac{8}{7}, \frac{6}{7}\right)$ E) $\left(\frac{13}{15}, \frac{17}{4}\right)$

Ans: C

Learning Objective: Solve for the point(s) of intersection of two linear equations

Section: 2.2

19. Determine any point(s) of intersection between the following equations.

$$y = -x^2 + 4x + 2$$

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

- A) $(-3, -19)$ D) $(3, 5)$
 B) $(1, 5), (-3, -19)$ E) $(-1, -3)$
 C) $(4, 2), (-1, -3)$

Ans: D

Learning Objective: Solve for point(s) of intersection of two quadratic equations

Section: 2.2

20. Find real numbers a and b such that the equation $a + bi = 7 + 10i$ is true.

- A) $a = -7, b = -10$ D) $a = 7, b = 10$
 B) $a = 7, b = -10$ E) $a = -3, b = 17$
 C) $a = -7, b = 10$

Ans: D

Learning Objective: Equate complex numbers

Section: 2.3

21. Write the complex number $+\sqrt{-25}$ in standard form.

- A) $+5i$ B) $-24i$ C) $+25i$ D) $26i$ E) $-5i$

Ans: A

Learning Objective: Write complex number in standard form

Section: 2.3

22. Simplify $-2i - (5 - 6i)$ and write the answer in standard form.

- A) $-5 - 8i$ B) $5 - 8i$ C) $5 + 4i$ D) $-3i$ E) $-5 + 4i$

Ans: E

Learning Objective: Add or subtract complex numbers

Section: 2.3

23. Perform the addition or subtraction and write the result in standard form.

$$-(6 - 12.9i) - (1.7 - \sqrt{-0.64})$$

- A) $-7.7 + 13.7i$ D) $-7.7 + 12.1i$
 B) $-4.3 + 13.7i$ E) $7.7 + 13.7i$
 C) $4.3 + 12.1i$

Ans: A

Learning Objective: Add or subtract complex numbers

Section: 2.3

24. Simplify $(-3 + i)(4 + 7i)$ and write the answer in standard form.

- A) $-25 - 17i$ B) $-19 + 25i$ C) $31 - 17i$ D) $31 - 5i$ E) $-19 - 17i$

Ans: E

Learning Objective: Multiply two complex numbers

Section: 2.3

25. Simplify $(5 + 4i)^2 - (5 - 4i)^2$ and write the answer in standard form.

- A) 0 B) $80i$ C) $50 + 80i$ D) $50 + 32i$ E) $10 + 16i$

Ans: B

Learning Objective: Simplify and write the result in standard form

Section: 2.3

26. Write the complex conjugate of the complex number $5 - \sqrt{15}i$.

- A) $-5 - \sqrt{15}i$ D) $5 + \sqrt{15}i$
 B) $5 - \sqrt{-15}i$ E) $-5 + \sqrt{15}i$
 C) $-5 - \sqrt{-15}i$

Ans: D

Learning Objective: Write the conjugate of a complex number

Section: 2.3

27. Write the complex conjugate of the following complex number and then multiply the number by the complex conjugate. Write the result in standard form.

$$-5 + \sqrt{-44}$$

- A) $-5 - 44i; 49$ D) $5 - 2\sqrt{11}i; 49$
 B) $-5 - 11\sqrt{2}i; 69$ E) $-5 - 2\sqrt{11}i; 69$
 C) $5 - 2\sqrt{11}i; 69$

Ans: E

Learning Objective: Write a quotient of complex numbers in standard form

Section: 2.3

28. Simplify $\frac{4+5i}{5+4i}$ and write the answer in standard form.
 A) $-\frac{40}{41}+\frac{9}{41}i$ B) $\frac{40}{41}-\frac{9}{41}i$ C) $\frac{40}{41}+\frac{9}{41}i$ D) $\frac{9}{41}+\frac{40}{41}i$ E) $\frac{9}{41}-\frac{40}{41}i$

Ans: C

Learning Objective: Write a quotient of complex numbers in standard form

Section: 2.3

29. Simplify $\frac{-6-4i}{8i}$ and write the answer in standard form.

A) $\frac{1}{2}+\frac{3i}{4}$ B) $-\frac{1}{2}+\frac{3i}{4}$ C) $-\frac{1}{2}-\frac{3i}{4}$ D) $-\frac{3}{4}-\frac{i}{2}$ E) $\frac{3}{4}-\frac{i}{2}$

Ans: B

Learning Objective: Write a quotient of complex numbers in standard form

Section: 2.3

30. Perform the following operation and write the result in standard form.

$$\frac{3i}{7+i} + \frac{7}{7-i}$$

A) $\frac{49}{48}+\frac{7}{12}i$ B) $\frac{13}{2}+\frac{7}{2}i$ C) $\frac{7}{50}+\frac{3}{50}i$ D) $\frac{26}{25}+\frac{14}{25}i$ E) $\frac{26}{3}+\frac{14}{3}i$

Ans: D

Learning Objective: Add two quotients of complex numbers

Section: 2.3

31. Combine $\frac{7}{i}-\frac{2}{3-i}$ and write the answer in standard form.

A) $-\frac{3}{4}-\frac{29}{4}i$ B) $\frac{3}{4}-\frac{29}{4}i$ C) $\frac{3}{4}+\frac{29}{4}i$ D) $\frac{3}{5}-\frac{36}{5}i$ E) $-\frac{3}{5}-\frac{36}{5}i$

Ans: E

Learning Objective: Subtract two quotients of complex numbers

Section: 2.3

32. Simplify $(\sqrt{-3})^{11}$ and write the answer in standard form.

A) $243\sqrt{3}i$ D) $-243\sqrt{3}$
 B) $-243\sqrt{3}i$ E) The expression cannot be simplified.
 C) $59,049\sqrt{3}i$

Ans: B

Learning Objective: Simplify and write a complex number in standard form

Section: 2.3

33. Write $x(x-5) = 3x^2 + 8$ in general form.

A) $2x^2 + 13 = 0$

D) $2x^2 + 5x + 8 = 0$

B) $4x^2 - 5x + 8 = 0$

E) $2x^2 - 5x - 8 = 0$

C) $4x^2 + 5x - 8 = 0$

Ans: D

Learning Objective: Write quadratic equation in general form

Section: 2.4

34. Solve $4 + 9x^2 - 12x = 0$ by factoring.

A) $x = \frac{2}{3}$

B) $x = -3, 2$

C) $x = \frac{2}{3}, -\frac{2}{3}$

D) $x = -2, 3$

E) $x = \frac{3}{2}, -\frac{3}{2}$

Ans: A

Learning Objective: Solve quadratic equation by factoring

Section: 2.4

35. Solve the following quadratic equation by factoring.

$$(r-a)^2 - 9b^2 = 0$$

A) $r = a, 9b$

D) $r = a + 3b, a - 3b$

B) $r = a + 3b, -a + 3b$

E) $r = -a - 3b, -a + 3b$

C) $r = a, -9b$

Ans: D

Learning Objective: Solve quadratic equation by factoring

Section: 2.4

36. Solve $(x-2)^2 = 49$ by extracting square roots.

A) $x = 7, -3$ B) $x = 7, -8$ C) $x = 9, -5$ D) $x = 10, -7$ E) $x = 6, -4$

Ans: C

Learning Objective: Solve quadratic equation by extracting square roots

Section: 2.4

37. Solve $x^2 + 8x + 9 = 0$ by completing the square.

A) $x = -16 \pm \sqrt{7}$

D) $x = 9 \pm \sqrt{7}$

B) $x = -4 \pm \sqrt{7}$

E) $x = 4 \pm \sqrt{7}$

C) $x = -9 \pm \sqrt{7}$

Ans: B

Learning Objective: Solve quadratic equation by completing the square

Section: 2.4

38. Solve $0 = 9x^2 - 12x - 2$ using the quadratic formula.

A) $x = \frac{-2 \pm \sqrt{6}}{3}$

D) $x = \frac{2 \pm \sqrt{6}}{3}$

B) $x = \frac{\pm \sqrt{6}}{3}$

E) $x = -\frac{2}{3}$

C) $x = \frac{-3 \pm \sqrt{6}}{2}$

Ans: D

Learning Objective: Solve quadratic equation using quadratic formula

Section: 2.4

39. Solve $0 = 49x^2 - 7$ using the quadratic formula.

A) $x = \frac{5 \pm \sqrt{7}}{7}$

D) $x = \frac{-5 \pm \sqrt{7}}{7}$

B) $x = \frac{\pm \sqrt{7}}{7}$

E) $x = \frac{5}{7}$

C) $x = \frac{-7 \pm \sqrt{7}}{5}$

Ans: B

Learning Objective: Solve quadratic equation with the quadratic formula

Section: 2.4

40. Solve $-0.9x^2 + 4x + 1.75 = 0$ using the quadratic formula. Round answers to nearest thousandth.

A) $x = -1.313, 4.976$

D) $x = -0.278, 3.846$

B) $x = -0.851, 4.516$

E) $x = 0.067, 4.937$

C) $x = -0.401, 4.846$

Ans: C

Learning Objective: Solve quadratic equation with the quadratic formula

Section: 2.4

41. Solve: $-15x^2 + 31x - 10 = 0$

A) $x = \frac{3}{5}, \frac{5}{2}$ B) $x = -\frac{2}{5}, \frac{3}{5}$ C) $x = -\frac{5}{3}, -\frac{2}{5}$ D) $x = -\frac{5}{3}, \frac{5}{2}$ E) $x = \frac{5}{3}, \frac{2}{5}$

Ans: E

Learning Objective: Solve quadratic equation using any method

Section: 2.4

42. Solve the following equation using any convenient method.

$$(x + 3)^2 = -100$$

- A) $x = -3, 10$ D) $x = -100, -3$
 B) $x = -3 \pm 10 i$ E) $x = -10 \pm 3 i$
 C) $x = -100, 10$

Ans: B

Learning Objective: Solve quadratic equation using any method

Section: 2.4

43. Solve the following equation using any convenient method.

$$x^2 - 6x + \frac{37}{4} = 0$$

- A) $x = -1 \pm \frac{3}{2} i$ D) $x = 3 \pm \frac{1}{2} i$
 B) $x = -2, -3$ E) $x = 6 \pm i$
 C) $x = -3, 7$

Ans: D

Learning Objective: Solve quadratic equation using any method

Section: 2.4

44. Solve the following equation using any convenient method.

$$(x - 9)^2 = x^2$$

- A) $x = -\frac{81}{4}$ B) $x = 81$ C) $x = 9$ D) $x = -9, 4$ E) $x = \frac{9}{2}$

Ans: E

Learning Objective: Solve quadratic equation using any method

Section: 2.4

45. Find two quadratic equations having the following solutions.

$$4 + 3\sqrt{6}, 4 - 3\sqrt{6}$$

- A) $x^2 - 8x + 54 = 0; -2x^2 + 16x - 108 = 0$
 B) $x^2 - 38 = 0; -2x^2 + 76 = 0$
 C) $x^2 - 8x - 38 = 0; -2x^2 + 16x + 76 = 0$
 D) $x^2 + 18x - 38 = 0; -2x^2 - 36x + 76 = 0$
 E) $x^2 - 8x + 18 = 0; -2x^2 + 16x - 36 = 0$

Ans: C

Learning Objective: Write two quadratic equations having same given solutions

Section: 2.4

46. Find two quadratic equations having the following solutions.

$$3 + 6i, 3 - 6i$$

- A) $x^2 - 6x + 45 = 0$; $-2x^2 + 12x - 90 = 0$
 B) $x^2 - 6x + 3 = 0$; $-2x^2 - 3x + 81 = 0$
 C) $x^2 + 6x + 15 = 0$; $-2x^2 - 6x - 63 = 0$
 D) $-x^2 - 12x + 45 = 0$; $2x^2 + 24x - 90 = 0$
 E) $x^2 + 9x + 9 = 0$; $-2x^2 - 12x - 9 = 0$

Ans: A

Learning Objective: Write two quadratic equations having same given solutions

Section: 2.4

47. Find all solutions of $x^4 - 4x^3 + x - 4 = 0$.

- A) $x = 1, \frac{-1 \pm \sqrt{3}i}{2}$ D) $x = -4, 1, \frac{1 \pm \sqrt{2}i}{3}$
 B) $x = 4, -1, \frac{1 \pm \sqrt{3}i}{2}$ E) $x = 4, -1$
 C) $x = -4, 1, \frac{-1 \pm \sqrt{3}i}{2}$

Ans: B

Learning Objective: Solve polynomial equation

Section: 2.5

48. Find all solutions of $\frac{1}{x^2} + \frac{6}{x} + 8 = 0$.

- A) $x = -2, -4$ D) $x = \frac{1}{6}, -\frac{1}{2}$
 B) $x = -2, 4$ E) $x = -\frac{1}{6}, \frac{1}{2}$
 C) $x = -\frac{1}{2}, -\frac{1}{4}$

Ans: C

Learning Objective: Solve equation involving fractions

Section: 2.5

49. Find all solutions of the following equation algebraically.

$$-6\left(\frac{w}{w-1}\right)^2 - 13\left(\frac{w}{w-1}\right) + 5 = 0$$

A) $w = \frac{1}{3}, -\frac{5}{2}$

D) $w = -\frac{1}{2}, \frac{5}{7}$

B) $w = 3, 5$

E) $w = 1, -2$

C) $w = -\frac{5}{2}, \frac{1}{7}$

Ans: D

Learning Objective: Solve equation for all solutions

Section: 2.5

50. Find the x-intercepts of the graph of the equation $y = -70x^4 - 116x^3 - 48x^2$.

A) $\left(\frac{6}{7}, 0\right), \left(-\frac{6}{7}, 0\right), \left(-\frac{4}{5}, 0\right)$

D) $x = (0, 0), \left(-\frac{6}{7}, 0\right), \left(-\frac{4}{5}, 0\right)$

B) $\left(\frac{4}{5}, 0\right), \left(-\frac{6}{7}, 0\right), \left(-\frac{4}{5}, 0\right)$

E) $x = (0, 0), \left(\frac{6}{7}, 0\right), \left(-\frac{4}{5}, 0\right)$

C) $(0, 0), \left(-\frac{6}{7}, 0\right), \left(\frac{4}{5}, 0\right)$

Ans: D

Learning Objective: Solve for the x-intercepts of the graph of an equation

Section: 2.5

51. In the following equation set $y = 0$ and solve.

$$y = x^4 - 61x^2 + 900$$

A) $x = -36, -25$

D) $x = -25, 30$

B) $x = 1, 30$

E) $x = \pm 30, \pm 6$

C) $x = \pm 5, \pm 6$

Ans: C

Learning Objective: Solve equation in quadratic form

Section: 2.5

52. Find all solutions of the following equation algebraically.

$$\sqrt[3]{5x-9} - 6 = 0$$

A) $x = -\frac{9}{5}$ B) $x = 45$ C) $x = -\frac{1}{9}$ D) $x = -\frac{5}{3}$ E) $x = -10$

Ans: B

Learning Objective: Solve radical equation

Section: 2.5

53. Find all solutions of $\sqrt{x} - \sqrt{x-11} = 1$.

- A) $x = 6$ B) $x = \sqrt{6}$ C) $x = 12$ D) $x = 36$ E) $x = -6$

Ans: D

Learning Objective: Solve radical equations

Section: 2.5

54. Find all solutions of the following equation algebraically.

$$4\sqrt{x-2} - \sqrt{x+9} = 0$$

- A) $x = \frac{17}{6}$ B) $x = \frac{17}{3}$ C) $x = \frac{11}{15}$ D) $x = \frac{5}{6}$ E) $x = \frac{41}{15}$

Ans: E

Learning Objective: Solve radical equations

Section: 2.5

55. Find all solutions of the following equation algebraically.

$$3\sqrt{x-3} - \sqrt{6x-23} = 2$$

- A) $x = -6$ B) $x = -4, 7$ C) $x = 23$ D) $x = 4$ E) $x = -6, 5$

Ans: D

Learning Objective: Solve radical equations

Section: 2.5

56. Find all solutions of the following equation algebraically.

$$9x^{2/3} + 24x^{1/3} + 16 = 0$$

- A) $x = -\frac{4}{3}$ B) $x = \frac{16}{9}$ C) $x = -\frac{64}{27}$ D) $x = -\frac{16}{9}$ E) $x = \frac{4}{3}$

Ans: C

Learning Objective: Solve an equation with rational exponents

Section: 2.5

57. Find all solutions of the following equation algebraically.

$$(x-6)^{2/3} = 25$$

- A) $x = \sqrt[3]{25} + 6$ B) $x = 31$ C) $x = \sqrt[3]{25} - 36$ D) $x = \frac{125}{36}$ E) $x = 131$

Ans: E

Learning Objective: Solve an equation with rational exponents

Section: 2.5

58. Find all solutions of $(x^2 + 9)^{3/2} = 125$.

- A) $x = \pm 4$ B) $x = \sqrt[3]{9}$ C) $x = -4$ D) $x = 5$ E) $x = \pm \sqrt[3]{9}$

Ans: A

Learning Objective: Solve an equation with rational exponents

Section: 2.5

59. Find all solutions of the following equation algebraically.

$$25x^2(x+2)^{1/3} + 20x(x+2)^{4/3} = 0$$

A) $x = 0, -2$

D) $x = -2, 2, \frac{5}{2}$

B) $x = 0, -\frac{8}{9}, -2$

E) $x = -5, -1, \frac{2}{5}$

C) $x = 0, 2, \frac{2}{5}$

Ans: B

Learning Objective: Solve an equation with rational exponents

Section: 2.5

60. Find the x -intercepts of the graph of the equation $y = 4x + \sqrt{5 - 79x}$.

A) $(5, 0)$

D) $(6, 0), \left(\frac{1}{17}, 0\right)$

B) $(-5, 0), \left(\frac{1}{16}, 0\right)$

E) $(6, 0), \left(\frac{1}{15}, 0\right)$

C) $(-5, 0)$

Ans: C

Learning Objective: Solve for the x -intercepts of the graph of an equation

Section: 2.5

61. Use a graphing utility to graph the following equation and approximate any x -intercepts of the graph.

$$y = 2\sqrt{x} - \frac{5.2}{\sqrt{x}} + 2.9$$

A) a) $y \approx -3, 6$

D) a) $y \approx 1$

B) a) $y \approx 3$

E) a) $y \approx 2$

C) a) $y \approx -3, 3$

Ans: D

Learning Objective: Approximate x -intercepts of graph

Section: 2.5

62. Set $y = 0$ and solve the resulting equation.

$$y = 3\sqrt{x} - \frac{15}{\sqrt{x}} - 12$$

A) $y = -1, 25$ B) $y = 5$ C) $y = -1, 5$ D) $y = 25$ E) $y = 1$

Ans: D

Learning Objective: Solve radical equations

Section: 2.5

63. Find all solutions of $-3x - 5 = \frac{-2}{x}$.
- A) $x = \frac{2}{3}, -2$ B) $x = -\frac{3}{2}, 3$ C) $x = \frac{1}{3}, -2$ D) $x = \frac{3}{2}, 2$ E) $x = -\frac{1}{2}, 3$

Ans: C

Learning Objective: Solve equation involving fractions

Section: 2.5

64. Find all solutions of the following equation.

$$\frac{36}{2x+3} + \frac{153}{5x-3} = 27$$

- A) $x = 2$ B) $x = -\frac{11}{10}$ C) $x = -\frac{11}{10}; x = 2$ D) $x = -\frac{9}{10}; x = 4$ E) $x = 4$

Ans: C

Learning Objective: Solve a rational equation

Section: 2.5

65. Find all solutions of the following equation.

$$\frac{x}{x^2-16} + \frac{7}{x+4} = 1$$

- A) $x = -4, 4$ B) $x = \frac{7}{16}, \frac{4}{7}$ C) $x = 2, 4$ D) $x = 2, 6$ E) $x = 6$

Ans: D

Learning Objective: Solve equation involving fractions

Section: 2.5

66. Find all solutions of $|8x - 6| = 3$.

- A) $x = -\frac{3}{8}, -\frac{9}{8}$ B) $x = \frac{9}{8}, \frac{3}{8}$ C) $x = \frac{9}{8}$ D) $x = \frac{2}{3}, -\frac{5}{6}$ E) $x = -\frac{3}{8}$

Ans: B

Learning Objective: Solve absolute value equations

Section: 2.5

67. Find all solutions of the following equation.

$$|x-3| = x^2 - 3x$$

- A) $x = 0, 1$ B) $x = 0, 3$ C) $x = -1, 3$ D) $x = -1, 0$ E) $x = -1$

Ans: C

Learning Objective: Solve equation involving absolute value

Section: 2.5

68. Find all solutions of the following equation.

$$x - 11 = |x^2 - 11x|$$

- A)
- $x = 1, 11$
- B)
- $x = -11, 11$
- C)
- $x = -11, 0$
- D)
- $x = 11$
- E)
- $x = 0, 1$

Ans: D

Learning Objective: Solve equation involving absolute value

Section: 2.5

69. Given the following equation, set
- $y = 0$
- and solve the resulting equation.

$$y = x + \frac{1}{x+8} + 6$$

- A)
- $x = -6$
- B)
- $x = -6, 6$
- C)
- $x = -7, 7$
- D)
- $x = -7$
- E)
- $x = 6$

Ans: D

Learning Objective: Solve equation involving rational expression

Section: 2.5

70. Find the
- x
- intercepts of the graph of the equation
- $y = |-8x + 1| - 5$
- .

A) $\left(\frac{1}{2}, 0\right), \left(-\frac{3}{4}, 0\right)$

D) $\left(-\frac{3}{4}, 0\right), \left(\frac{3}{4}, 0\right)$

B) $\left(-\frac{1}{2}, 0\right), \left(-\frac{3}{4}, 0\right)$

E) $\left(-\frac{1}{2}, 0\right), \left(\frac{3}{4}, 0\right)$

C) $\left(-\frac{1}{2}, 0\right), \left(\frac{1}{2}, 0\right)$

Ans: E

Learning Objective: Solve for the x -intercepts of the graph of an equation

Section: 2.5

71. Find an equation that has
- $x = i, -i, 2$
- , and
- 1
- as solutions.

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

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

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

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

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

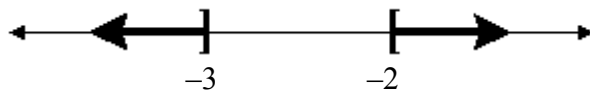
Ans: A

Learning Objective: Write a possible equation given roots

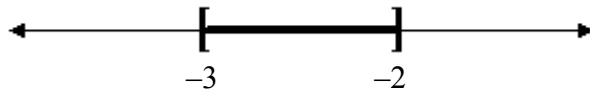
Section: 2.5

72. Match the inequality $-3 \leq x \leq -2$ with its graph.

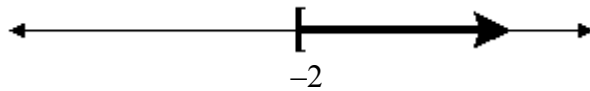
A)



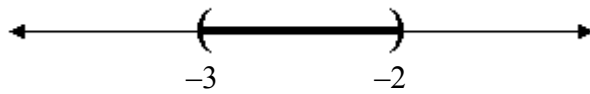
B)



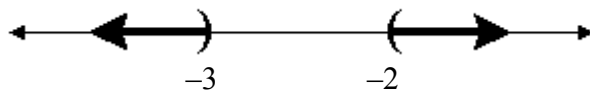
C)



D)



E)



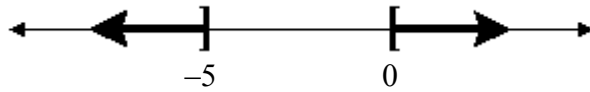
Ans: B

Learning Objective: Graph inequality

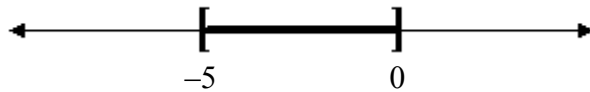
Section: 2.6

73. Match the inequality $-5 < x < 0$ with its graph.

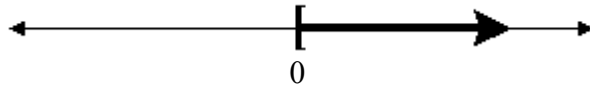
A)



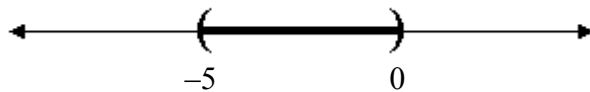
B)



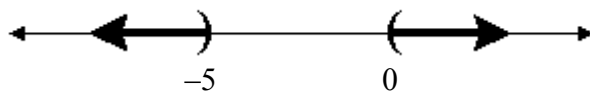
C)



D)



E)



Ans: D

Learning Objective: Graph inequality

Section: 2.6

74. Which of the following is not a solution to the inequality $-3 \leq \frac{x+9}{18} \leq 3$?

A) $x = -63$ B) $x = -65$ C) $x = 42$ D) $x = 40$ E) $x = 9$

Ans: B

Learning Objective: Identify a number that is not a solution of an inequality

Section: 2.6

75. Which of the following is not a solution to the inequality $|9x + 8| < 9$?

A) $x = 0$ B) $x = -\frac{8}{9}$ C) $x = -\frac{16}{9}$ D) $x = -\frac{5}{6}$ E) $x = -\frac{17}{9}$

Ans: E

Learning Objective: Identify a number that is not a solution of an inequality

Section: 2.6

76. Solve: $-4 < -(x+9) \leq 3$

A) $-12 \leq x < -5$

B) $-13 < x \leq -12$

C) $5 > x \geq -12$

D) $-12 > x \geq 13$

E) no solution

Ans: A

Learning Objective: Solve inequality

Section: 2.6

77. Solve: $7(x-2) > 7x-7$

A) $x > 7$ B) $-7 < x < 2$ C) $x \leq -12$ D) $x < -2$ E) no solution

Ans: E

Learning Objective: Solve inequality

Section: 2.6

78. Solve: $|-12+4x|-10 < 8$

A) $x < \frac{15}{2}$

D) $-\frac{5}{2} < x < -\frac{7}{2}$

B) $-\frac{15}{2} < x < \frac{3}{2}$

E) no solution

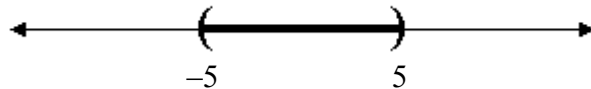
C) $-\frac{3}{2} < x < \frac{15}{2}$

Ans: C

Learning Objective: Solve inequality

Section: 2.6

79. Use absolute value notation to define the interval shown below.



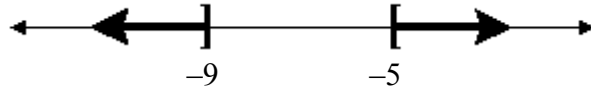
A) $|x+5| < 0$ B) $|x| > -5$ C) $|5-x| > 0$ D) $|x| < 5$ E) $|x-5| > 0$

Ans: D

Learning Objective: Write absolute value descriptions

Section: 2.6

80. Use absolute value notation to define the interval shown below.



- A) $2 - |x - 7| \leq 0$ D) $|x - 7| - 2 \geq 0$
 B) $|x + 7| - 2 \geq 0$ E) $-9 \leq x \leq -5$
 C) $|7 - x| \geq 2$

Ans: B

Learning Objective: Write absolute value descriptions

Section: 2.6

81. Determine the intervals on which the following polynomial is entirely negative and those on which it is entirely positive.

$$-x^2 - 6x - 5$$

- A) entirely negative: $(-\infty, 2)$; entirely positive: $(2, \infty)$
 B) entirely negative: $(-\infty, -5), (-1, 2)$; entirely positive: $(-5, 2)$
 C) entirely negative: $(-\infty, -5), (-1, \infty)$; entirely positive: $(-5, -1)$
 D) entirely negative: $(-5, 2)$; entirely positive: $(-\infty, -5), (-1, 2)$
 E) entirely negative: $(-\infty, 0)$; entirely positive: $(0, \infty)$

Ans: C

Learning Objective: Identify intervals where graph is entirely positive and/or negative

Section: 2.6

82. Solve: $x^2 - 2x - 8 < 0$

- A) $(-\infty, -2)$ B) $(-2, \infty)$ C) $(-2, 4)$ D) $(-\infty, 4)$ E) $(4, \infty)$

Ans: C

Learning Objective: Solve inequality

Section: 2.6

83. Solve the inequality $36x - x^3 < 0$ and write the solution set in interval notation.

- A) $(-\infty, -6) \cup (0, 6)$ D) $(-6, 0) \cup (6, \infty)$
 B) $(-6, 6)$ E) $(-\infty, \infty)$
 C) $(-\infty, 6)$

Ans: D

Learning Objective: Solve inequality

Section: 2.6