

Sec. 1.4 and 1.5

1. The number of real roots of the equation $5x^{-4} + 2x^{-3} = 0$ is

- (a) 1
- (b) 2
- (c) 3
- (d) 4
- (e) 0

2. The solution set, in interval notation, of the compound inequality

$$|2x - 1| \leq 3 \quad \text{and} \quad x^2 + 2x \geq 0$$

is

- (a) $[0, 2]$
- (b) $[-2, -1] \cup [0, \infty)$
- (c) $(-\infty, -1] \cup [0, \infty)$
- (d) $(-\infty, -2] \cup [0, 2]$
- (e) $[-2, -1] \cup [2, \infty)$

3. The solution set of the equation

$$(x + 1)^{2/3} - 2(x + 1)^{1/3} - 3 = 0$$

contains

- (a) One positive and one negative integers
- (b) two positive integers.
- (c) two negative integers
- (d) One positive and one negative irrational numbers
- (e) two positive irrational numbers

4. The solution, in interval notation, of the inequality $\frac{3x^2+6x-16}{x-1} \geq 8$ is

- (a) $[-\frac{4}{3}, 1) \cup [2, \infty)$
- (b) $[-2, 0) \cup (2, \infty)$
- (c) $(-\frac{2}{3}, 0) \cup (\frac{5}{2}, \infty)$
- (d) $[-\infty, -3) \cup (2, \infty)$
- (e) $[-\frac{4}{3}, 0] \cup [1, 2]$

5. The set of all real numbers x for which $1 < x \leq 8$ and $|2x - 5| \geq 1$ is given by the interval

- (a) $(1, 2] \cup [3, 8]$
- (b) $[2, 3]$
- (c) $(1, 3]$
- (d) $[2, 3] \cup [6, 8]$

(e) $(1, 3] \cup [6, 8]$

6. The sum of the solutions of the equations of the equation

$$x^{\frac{2}{3}} + 2x^{\frac{1}{3}} - 3 = 0$$

(a) -26

(b) 25

(c) -21

(d) 29

(e) -2

7. If $\frac{A}{B} = \frac{y-x}{x-z}$, then x is equal to

(a) $\frac{Az+By}{A+B}$

(b) $\frac{Az-By}{A-B}$

(c) $\frac{Ay+Bz}{A+B}$

(d) $\frac{Ay-Bz}{A-B}$

(e) $\frac{A+B}{Ay+Bz}$

8. Solve

$$(x+1)^{2/3} - 3(x+1)^{1/3} - 1 = 0.$$

9. Solve

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

10. Find a positive number that is 5 larger than its reciprocal.

11. Solve $(x-3)^{1/2} - 5(x-3)^{1/4} + 6 = 0$.

12. Solve

$$\frac{2(x-2)}{3} - \frac{5-x}{x+3} = \frac{2(x-1)}{x+3}$$

13. Solve

$$\sqrt{8x+1} - 4 = 1 - 2x$$

14. The sum of all solutions of the equation

$$\frac{|x-1|+2}{1+|x-1|} - \frac{3}{2} = 0.$$

is equal to

(a) 2

(b) 0

(c) 1

(d) -5

(e) 1

15. The solution set of the inequality

$$\frac{2 - x^2}{x} \leq 1$$

in interval notation is equal to

(a) $[-2, 0) \cup [1, \infty)$

(b) $(0, 1]$

(c) $(-\infty, -2] \cup [1, \infty)$

(d) $[-2, 0) \cup (0, 1]$

(e) $(-\infty, -1] \cup [2, \infty)$

16. Solve $\sqrt{2x} = \sqrt{x + 7} - 1$

17. The sum of a real number and twice its reciprocal is $\frac{73}{6}$. Find all such numbers.

18. The equation

$$5 + 3x + \sqrt{5 + 3x} = 0$$

has

(a) only one negative rational root.

(b) two negative rational root.

(c) only one positive rational root.

(d) two positive rational root.

(e) no real roots.

19. The solution of the inequality $\frac{(x+1)^3(2-x)}{x^2} \leq 0$ is equal to

(a) $(-\infty, -1] \cup [2, \infty)$

(b) $[-1, -0) \cup (0, 2]$

(c) $(-\infty, 0) \cup [2, \infty)$.

(d) $[2, \infty)$

20. Solve $\sqrt{2x} = \sqrt{x + 7} - 1$.

21. Solve the inequality $0 < |3 - 2x| \leq 7$. Give the solution set using the interval notation.

22. Solve the equality $\frac{x-4}{x-1} \leq -x$, then write the solution set in interval notation.

23. Solve the compound inequality

$$-4x + 5 > 9 \quad \text{AND} \quad |x - 1| < 3$$

(write your answer in interval notation)

24. Solve $(8x + 8)^{\frac{2}{3}} - (x + 1)^{\frac{1}{3}} - 1 = 0$.

25. Solve $x = 2 + \sqrt{2 - x}$.

26. Solve the equation $|4 - 3x| = 4 - 5x$.

27. Solve the equation $\sqrt{x - 3} = \sqrt{2\sqrt{x}}$.

28. Find the solution of the inequality

$$\frac{x^2 + 10}{x} \geq 11$$

write your answer in the interval notation.

29. If $m < n$, solve the inequality for x : $|m + n - 2|n - m$.

30. The inequality $(x + 2)(x - 1) < 4$ is equivalent to

(a) $(x + 3)(x - 2) < 0$

(b) $x + 2 < 4$ and $x - 1 < 4$

(c) $x + 2 < 4$ or $x - 1 < 4$

(d) $x + 2 < \frac{4}{x-1}$

31. Solve the following equations

(a) $\sqrt{x - 1} - \sqrt{x - 4} = 1$

(b) $x^4 + 3x^3 - 8x - 24 = 0$

32. Solve the inequality $\frac{1}{x^2 + 4x - 5} \leq \frac{3}{x + 5}$

33. Find the solution of the inequality $1 < |x + 1| < 2$. Write your answer in interval notation.

34. Solve the absolute value equation

$$\left| \frac{3x - 4}{5} \right| - \frac{7}{5} = -1.$$

35. The solution of the equation $(x - 3)^{1/2} - 5(x - 3)^{1/4} + 6 = 0$ is

(a) $\{-2, -3\}$

(b) ϕ

(c) $\{16, 81\}$

(d) $\{19, 84\}$

(e) $\{4, 9\}$

36. If A is the solution set of $|2x - 1| \leq 5$ and B is the solution set of the $|x + 1| > 2$ the $A \cap B$ is

37. The solution set in interval notation for $\frac{5}{2w+3} \geq \frac{-5}{w}$ is:

38. The solution set in the interval notation for $m - 6m^2 > -35$ is \dots .

39. The solution set of $\frac{2(x-1)}{3} - \frac{5-x}{x+3} = \frac{2(x-1)}{x+3}$ is \dots .

40. The solution set of the compound inequality

$$\frac{7x + 6}{6} > \frac{x + 2}{2} \quad \text{OR} \quad 4(x + 4) > 2(2 - x)$$

in interval notation is equal to \dots .

41. The solution set of $|x| + 3x - 9 = 0$ consists of

- (a) only one negative rational root.
- (b) two negative rational root.
- (c) only one positive rational root.
- (d) two positive rational root.
- (e) no real roots.
- (f) one positive and one negative rational numbers

42. Find the solution set in interval notation for the inequality

$$\frac{3 - 2x - x^2}{x^2 + 4x - 3} \leq 0$$