

Chapter 10

Exercise Set 10.1

Evaluate the function at the indicated values.

1. $f(x) = x^2 - 2x + 5$; $x = -2, -1, 0, 1, 2$

2. $f(x) = x^3 + x$; $x = -2, -1, 0, 1, 2$

3. $f(x) = \sqrt[3]{x^2}$; $x = -2, -1, 0, 1, 2$

4. $f(x) = |1 - x|$; $x = -3, -1, 1, 3, 5$

5. $f(x) = \frac{1 - 2x}{1 + 2x}$; $x = -2, -1, 0, 1, 2$

6. $f(x) = \frac{|x+1|}{x+1}$; $x = -4, -3, -2, 0, 1, 2$

7. $f(x) = \sqrt{2x+1}$; $x = -\frac{1}{2}, 0, \frac{1}{2}, \frac{3}{2}, \frac{5}{2}, 4$

8. $f(x) = \frac{x^2 - 1}{x^2 + 1}$; $x = -2, -1, 0, 1, 2$

9. $f(x) = \sqrt{x^2 + x - 2}$; $x = -5, -3, -2, 1, 2, 5$

10. $f(x) = x + \frac{1}{x^2 + 1}$; $x = -2, -1, 0, 1, 2$

11. $f(x) = \frac{1}{2x+1} + \frac{1}{2x-1}$; $x = -2, -1, 0, 1, 2$

12. $f(x) = \sqrt{|x-1|}$; $x = -3, -2, -1, 0, 1, 2, 3$

Find the domain of the given function.

13. $f(x) = \frac{1}{x+4}$

14. $f(x) = \sqrt{x-2}$

15. $f(x) = x^2 - 4x + 4$

16. $f(x) = \frac{x+2}{x^2-1}$

17. $f(x) = \frac{2x-4}{x^2+2x-15}$

18. $f(x) = \sqrt{5-x}$

19. $f(x) = |2x-3|$

20. $f(x) = \frac{x-1}{\sqrt{3x-1}}$

21. $f(x) = \frac{x^2+5x+6}{2x^2-x-1}$

22. $f(x) = \sqrt{|x-3|}$

23. $f(x) = \frac{1}{\sqrt{|x-3|}}$

24. $f(x) = \frac{x^2-1}{x^2+6x}$

25. $f(x) = \sqrt{3x-5}$

26. $f(x) = \frac{1}{\sqrt{3x-5}}$

27. $f(x) = \frac{1}{3x^2-x-14}$

28. $f(x) = \frac{\sqrt{x+1}}{\sqrt{x-1}}$

Find a function f with the given domain.

29. $\text{Domain}(f) = (-\infty, -2]$

30. $\text{Domain}(f) = [3, \infty)$

31. $\text{Domain}(f) = \{x \in \mathbb{R} : x \neq 2\}$

32. $\text{Domain}(f) = \{x \in \mathbb{R} : x \neq 2, x \neq -2\}$

33. $\text{Domain}(f) = \left[\frac{7}{3}, \infty\right)$

34. $\text{Domain}(f) = \{x \in \mathbb{R} : x \neq 0, x \neq 5\}$

35. $\text{Domain}(f) = (2, \infty)$

36. $\text{Domain}(f) = [-2, 5) \cup (5, \infty)$

Exercise Set 10.2

Solve the given equation.

1. $\frac{1}{x} = \frac{3}{x+4}$

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

3. $\frac{1}{x} + \frac{1}{5x} = 6$

4. $|3x| = 12$

5. $\frac{\sqrt{2x-1}}{3} = 1$

6. $\frac{1}{x+1} - \frac{1}{3} = \frac{1}{3x+3}$

7. $|2x-5| = 7$

8. $3\sqrt{3x+1} - 5 = 7$

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

10. $|x-4| = 0.01$

11. $\sqrt{\frac{5-2x}{3}} = 2$

12. $\frac{1}{x} - \frac{1}{2} = \frac{3}{4}$

13. $\frac{1}{2x-1} + \frac{5}{2} = \frac{3}{4x-2}$

14. $\left| \frac{x-3}{5} \right| = 2$

15. $4\sqrt{7-3x} = 12$

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

17. $|9-2x| = 7$

18. $\sqrt{|2x+6|} = 4$

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

20. $\frac{1}{2}x - \frac{x+4}{3} = 1$

21. $\sqrt{|3x-6|} = 3$

22. $\frac{3}{2x+1} = \frac{4}{5x}$