4.3 Assess Your Understanding

'Are You Prepared?' *The answer is given at the end of these exercises. If you get a wrong answer, read the pages listed in red.*

1. Find the intercepts of the graph of the equation $y = \dfrac{x^2 - 1}{x^2 - 4}$. (pp. 11–12)

Concepts and Vocabulary

2. If the numerator and the denominator of a rational function have no common factors, the rational function is _____.
3. The graph of a rational function never intersects a _____ asymptote.
4. ***True or False*** The graph of a rational function sometimes intersects an oblique asymptote.
5. ***True or False*** The graph of a rational function sometimes has a hole.
6. $R(x) = \dfrac{x(x-2)^2}{x-2}$
   (a) Find the domain of R.
   (b) Find the x-intercepts of R.

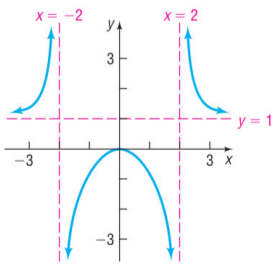
Skill Building

In Problems 7–44, follow Steps 1 through 8 on pages 201–202 to analyze the graph of each function.

7. $R(x) = \dfrac{x+1}{x(x+4)}$
8. $R(x) = \dfrac{x}{(x-1)(x+2)}$
9. $R(x) = \dfrac{3x+3}{2x+4}$
10. $R(x) = \dfrac{2x+4}{x-1}$
11. $R(x) = \dfrac{3}{x^2-4}$
12. $R(x) = \dfrac{6}{x^2-x-6}$
13. $P(x) = \dfrac{x^4+x^2+1}{x^2-1}$
14. $Q(x) = \dfrac{x^4-1}{x^2-4}$
15. $H(x) = \dfrac{x^3-1}{x^2-9}$
16. $G(x) = \dfrac{x^3+1}{x^2+2x}$
17. $R(x) = \dfrac{x^2}{x^2+x-6}$
18. $R(x) = \dfrac{x^2+x-12}{x^2-4}$
19. $G(x) = \dfrac{x}{x^2-4}$
20. $G(x) = \dfrac{3x}{x^2-1}$
21. $R(x) = \dfrac{3}{(x-1)(x^2-4)}$
22. $R(x) = \dfrac{-4}{(x+1)(x^2-9)}$
23. $H(x) = \dfrac{x^2-1}{x^4-16}$
24. $H(x) = \dfrac{x^2+4}{x^4-1}$
25. $F(x) = \dfrac{x^2-3x-4}{x+2}$
26. $F(x) = \dfrac{x^2+3x+2}{x-1}$
27. $R(x) = \dfrac{x^2+x-12}{x-4}$
28. $R(x) = \dfrac{x^2-x-12}{x+5}$
29. $F(x) = \dfrac{x^2+x-12}{x+2}$
30. $G(x) = \dfrac{x^2-x-12}{x+1}$
31. $R(x) = \dfrac{x(x-1)^2}{(x+3)^3}$
32. $R(x) = \dfrac{(x-1)(x+2)(x-3)}{x(x-4)^2}$
33. $R(x) = \dfrac{x^2+x-12}{x^2-x-6}$
34. $R(x) = \dfrac{x^2+3x-10}{x^2+8x+15}$
35. $R(x) = \dfrac{6x^2-7x-3}{2x^2-7x+6}$
36. $R(x) = \dfrac{8x^2+26x+15}{2x^2-x-15}$
37. $R(x) = \dfrac{x^2+5x+6}{x+3}$
38. $R(x) = \dfrac{x^2+x-30}{x+6}$
39. $f(x) = x + \dfrac{1}{x}$
40. $f(x) = 2x + \dfrac{9}{x}$
41. $f(x) = x^2 + \dfrac{1}{x}$
42. $f(x) = 2x^2 + \dfrac{16}{x}$
43. $f(x) = x + \dfrac{1}{x^3}$
44. $f(x) = 2x + \dfrac{9}{x^3}$

In Problems 45–48, find a rational function that might have the given graph. (More than one answer might be possible.)

45.



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