The figure shows the graph of y = f(x) and its two vertical asymptotes. Use the graph to solve Exercises 1–10.
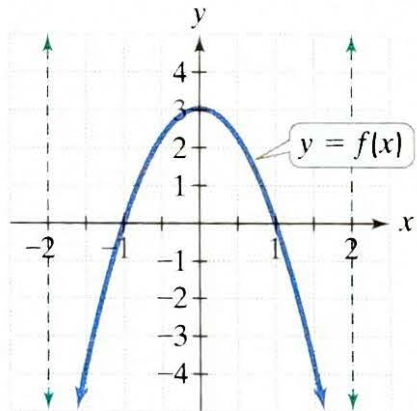
1. Find the domain and the range of f.
2. Find the zeros.
3. What is the relative maximum and where does it occur?
4. Find the interval(s) on which f is decreasing.

5. Is $f(-0.7)$ positive or negative?
6. Find $(f \circ f)(-1)$.
7. Use arrow notation to complete this statement:

$$f(x) \rightarrow -\infty \text{ as } \underline{\hspace{1cm}} \text{ or as } \underline{\hspace{1cm}}.$$

8. Does f appear to be even, odd, or neither?
9. Graph $g(x) = f(x + 2) - 1$.
10. Graph $h(x) = \frac{1}{2}f\left(\frac{1}{2}x\right)$.

In Exercises 11–21, solve each equation, inequality, or system of equations.

11. $\sqrt{x^2 - 3x} = 2x - 6$ 12. $4x^2 = 8x - 7$

13. $\left|\frac{x}{3} + 2\right| < 4$ 14. $\frac{x + 5}{x - 1} > 2$

15. $2x^3 + x^2 - 13x + 6 = 0$ 16. $6x - 3(5x + 2) = 4(1 - x)$

17. $\log(x + 3) + \log x = 1$ 18. $3^{x+2} = 11$

19. $x^{\frac{1}{2}} - 2x^{\frac{1}{4}} - 15 = 0$

20. $\begin{cases} 3x - y = -2 \\ 2x^2 - y = 0 \end{cases}$

21. $\begin{cases} x + 2y + 3z = -2 \\ 3x + 3y + 10z = -2 \\ 2y - 5z = 6 \end{cases}$

In Exercises 22–28, graph each equation, function, or inequality in a rectangular coordinate system. If two functions are indicated, graph both in the same system.

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

23. $2x - 3y \le 6$

24. $y = 3^{x-2}$

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

26. $f(x) = 2x - 4$ and f^{-1}

27. $(x - 2)^2 + (y - 4)^2 > 9$

28. $f(x) = |x|$ and $g(x) = -|x - 2|$

In Exercises 29–30, let $f(x) = 2x^2 - x - 1$ and $g(x) = 1 - x$.

29. Find $(f \circ g)(x)$ and $(g \circ f)(x)$.

30. Find $\dfrac{f(x + h) - f(x)}{h}$ and simplify.

In Exercises 31–32, write the linear function in slope-intercept form satisfying the given conditions.

31. Graph of f passes through $(2, 4)$ and $(4, -2)$.

32. Graph of g passes through $(-1, 0)$ and is perpendicular to the line whose equation is $x + 3y - 6 = 0$.

33. You invested $4000 in two stocks paying 12% and 14% annual interest. At the end of the year, the total interest from these investments was $508. How much was invested at each rate?

34. The length of a rectangle is 1 meter more than twice the width. If the rectangle's area is 36 square meters, find its dimensions.

35. What interest rate is required for an investment of $6000 subject to continuous compounding to grow to $18,000 in 10 years?