

8. Let g be the function defined by $g(u) = (3u - 2)^{3/2}$. Find $g(1)$, $g(6)$, $g(\frac{11}{3})$, and $g(u + 1)$.

9. Let f be the function defined by $f(t) = \frac{2t^2}{\sqrt{t-1}}$. Find $f(2)$, $f(a)$, $f(x+1)$, and $f(x-1)$.

10. Let f be the function defined by $f(x) = 2 + 2\sqrt{5-x}$. Find $f(-4)$, $f(1)$, $f(\frac{11}{4})$, and $f(x+5)$.

11. Let f be the function defined by

$$f(x) = \begin{cases} x^2 + 1 & \text{if } x \leq 0 \\ \sqrt{x} & \text{if } x > 0 \end{cases}$$

Find $f(-2)$, $f(0)$, and $f(1)$.

12. Let g be the function defined by

$$g(x) = \begin{cases} -\frac{1}{2}x + 1 & \text{if } x < 2 \\ \sqrt{x-2} & \text{if } x \geq 2 \end{cases}$$

Find $g(-2)$, $g(0)$, $g(2)$, and $g(4)$.

13. Let f be the function defined by

$$f(x) = \begin{cases} -\frac{1}{2}x^2 + 3 & \text{if } x < 1 \\ 2x^2 + 1 & \text{if } x \geq 1 \end{cases}$$

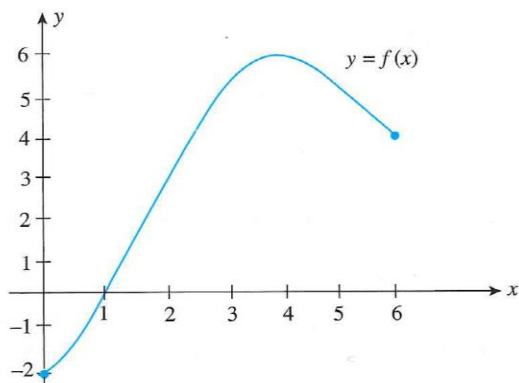
Find $f(-1)$, $f(0)$, $f(1)$, and $f(2)$.

14. Let f be the function defined by

$$f(x) = \begin{cases} 2 + \sqrt{1-x} & \text{if } x \leq 1 \\ \frac{1}{1-x} & \text{if } x > 1 \end{cases}$$

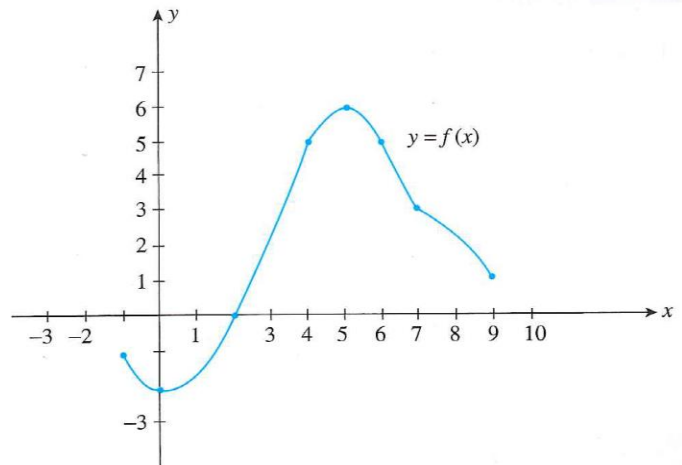
Find $f(0)$, $f(1)$, and $f(2)$.

15. Refer to the graph of the function f in the following figure.



- Find the value of $f(0)$.
- Find the value of x for which (i) $f(x) = 3$ and (ii) $f(x) = 0$.
- Find the domain of f .
- Find the range of f .

16. Refer to the graph of the function f in the following figure.



- Find the value of $f(7)$.
- Find the values of x corresponding to the point(s) on the graph of f located at a height of 5 units from the x -axis.
- Find the point on the x -axis at which the graph of f crosses it. What is the value of $f(x)$ at this point?
- Find the domain and range of f .

In Exercises 17–20, determine whether the point lies on the graph of the function.

17. $(2, \sqrt{3})$; $g(x) = \sqrt{x^2 - 1}$

18. $(3, 3)$; $f(x) = \frac{x+1}{\sqrt{x^2+7}} + 2$

19. $(-2, -3)$; $f(t) = \frac{|t-1|}{t+1}$

20. $(-3, -\frac{1}{13})$; $h(t) = \frac{|t+1|}{t^3+1}$

In Exercises 21 and 22, find the value of c such that the point $P(a, b)$ lies on the graph of the function f .

21. $f(x) = 2x^2 - 4x + c$; $P(1, 5)$

22. $f(x) = x\sqrt{9-x^2} + c$; $P(2, 4)$

In Exercises 23–36, find the domain of the function.

23. $f(x) = x^2 + 3$

24. $f(x) = 7 - x^2$

25. $f(x) = \frac{3x+1}{x^2}$

26. $g(x) = \frac{2x+1}{x-1}$

27. $f(x) = \sqrt{x^2+1}$

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

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

30. $g(x) = \sqrt{2x^2+3}$

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

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

33. $f(x) = (x+3)^{3/2}$

34. $g(x) = 2(x-1)^{5/2}$