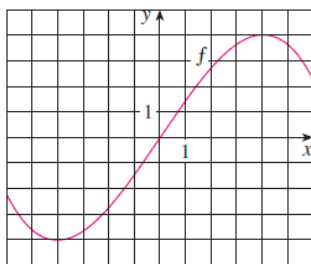


1. Let f be the function whose graph is given.
- Estimate the value of $f(2)$.
 - Estimate the values of x such that $f(x) = 3$.
 - State the domain of f .
 - State the range of f .
 - On what interval is f increasing?
 - Is f one-to-one? Explain.
 - Is f even, odd, or neither even nor odd? Explain.



2. The graphs of f and g are given.
- State the values of $f(-4)$ and $g(3)$.
 - For what values of x is $f(x) = g(x)$?
 - Estimate the solution of the equation $f(x) = -1$.
 - On what interval is f decreasing?
 - State the domain and range of f .
 - State the domain and range of g .

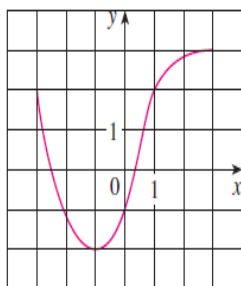
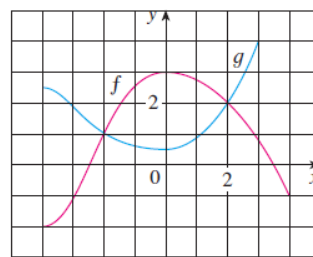
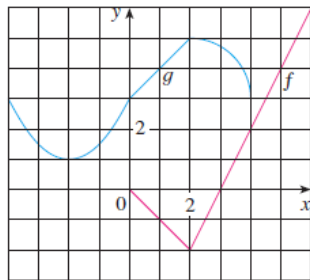


FIGURE FOR PROBLEM 1

- The graph of a function f is given at the left.
 - State the value of $f(-1)$.
 - Estimate the value of $f(2)$.
 - For what values of x is $f(x) = 2$?
 - Estimate the values of x such that $f(x) = 0$.
 - State the domain and range of f .
- If $f(x) = x^3$, evaluate the difference quotient $\frac{f(2+h) - f(2)}{h}$ and simplify your answer.
- Find the domain of the function.
 - $f(x) = \frac{2x+1}{x^2+x-2}$
 - $g(x) = \frac{\sqrt[3]{x}}{x^2+1}$
 - $h(x) = \sqrt{4-x} + \sqrt{x^2-1}$
- How are graphs of the functions obtained from the graph of f ?
 - $y = -f(x)$
 - $y = 2f(x) - 1$
 - $y = f(x-3) + 2$
- Without using a calculator, make a rough sketch of the graph.
 - $y = x^3$
 - $y = (x+1)^3$
 - $y = (x-2)^3 + 3$
 - $y = 4 - x^2$
 - $y = \sqrt{x}$
 - $y = 2\sqrt{x}$
 - $y = -2^x$
 - $y = 1 + x^{-1}$
- Let $f(x) = \begin{cases} 1 - x^2 & \text{if } x \leq 0 \\ 2x + 1 & \text{if } x > 0 \end{cases}$
 - Evaluate $f(-2)$ and $f(1)$.
 - Sketch the graph of f .
- If $f(x) = x^2 + 2x - 1$ and $g(x) = 2x - 3$, find each of the following functions.
 - $f \circ g$
 - $g \circ f$
 - $g \circ g \circ g$

Use the given graphs of f and g to evaluate each expression, or explain why it is undefined.

- (a) $f(g(2))$ (b) $g(f(0))$ (c) $(f \circ g)(0)$
(d) $(g \circ f)(6)$ (e) $(g \circ g)(-2)$ (f) $(f \circ f)(4)$



Use the table to evaluate each expression.

- (a) $f(g(1))$ (b) $g(f(1))$ (c) $f(f(1))$
(d) $g(g(1))$ (e) $(g \circ f)(3)$ (f) $(f \circ g)(6)$

x	1	2	3	4	5	6
$f(x)$	3	1	4	2	2	5
$g(x)$	6	3	2	1	2	3

In Problems 29–36, sketch the graph by hand, using a graphing utility as an aid, and find the domain, range, and any points of discontinuity.

$$29. f(x) = \begin{cases} x + 1 & \text{if } -1 \leq x < 0 \\ -x + 1 & \text{if } 0 \leq x \leq 1 \end{cases}$$

$$30. f(x) = \begin{cases} x & \text{if } -2 \leq x < 1 \\ -x + 2 & \text{if } 1 \leq x \leq 2 \end{cases}$$

$$31. f(x) = \begin{cases} -2 & \text{if } -3 \leq x < -1 \\ 4 & \text{if } -1 < x \leq 2 \end{cases}$$

$$32. f(x) = \begin{cases} 1 & \text{if } -2 \leq x < 2 \\ -3 & \text{if } 2 < x \leq 5 \end{cases}$$

$$33. f(x) = \begin{cases} x + 2 & \text{if } x < -1 \\ x - 2 & \text{if } x \geq -1 \end{cases}$$

$$34. f(x) = \begin{cases} -1 - x & \text{if } x \leq 2 \\ 5 - x & \text{if } x > 2 \end{cases}$$

$$35. g(x) = \begin{cases} x^2 + 1 & \text{if } x < 0 \\ -x^2 - 1 & \text{if } x > 0 \end{cases}$$