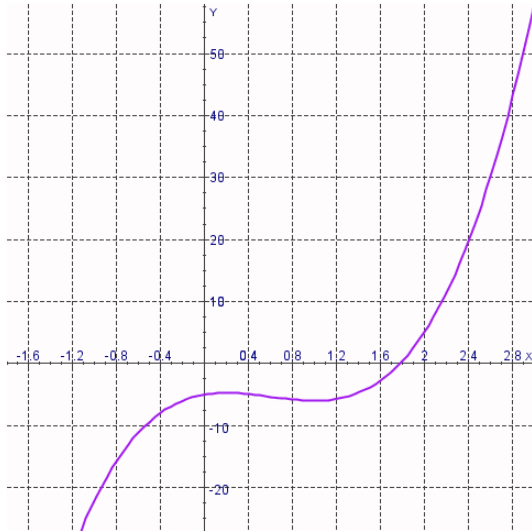


MULTIPLE CHOICE

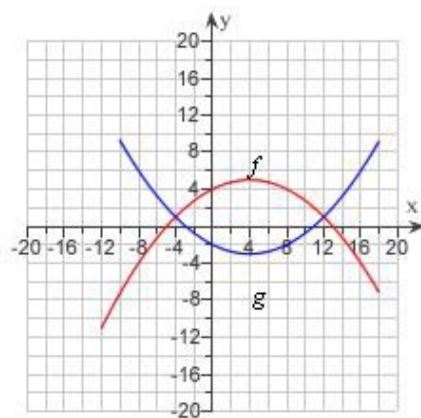
1. The graph of the function f is given. State the value of $f(-0.4)$.



- a. $f(-0.4) = -10$
- b. $f(-0.4) = 10$
- c. $f(-0.4) = 0$
- d. $f(-0.4) = 8$
- e. $f(-0.4) = -8$

ANS: E PTS: 1 DIF: Medium REF: 1.1.3b
MSC: Bimodal NOT: Section 1.1

2. The graphs of $f(x)$ and $g(x)$ are given. For what values of x is $f(x) = g(x)$?

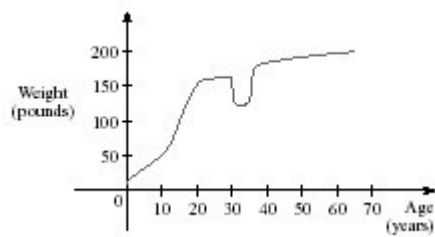


- a. 4, 2

- b. -1
- c. 0
- d. -2,5
- e. -4, 12

ANS: E PTS: 1 DIF: Medium REF: 1.1.4b
 MSC: Bimodal NOT: Section 1.1

3. The graph shown gives the weight of a certain person as a function of age. Find the age at which the person started an exercise program.



- a. 35
- b. 38
- c. 20
- d. 54
- e. 30

ANS: E PTS: 1 DIF: Medium REF: 1.1.9
 MSC: Bimodal NOT: Section 1.1

4. If $f(x) = 4x^2 + 2$, find and simplify $\frac{f(1+h) - f(1)}{h}$, where $h \neq 0$.

- a. $8 + 4h$
- b. $2 + 4h^2$
- c. $4h$
- d. $4 + 8h$

ANS: A PTS: 1 DIF: Easy REF: 1.1.21
 MSC: Bimodal NOT: Section 1.1

5. If $f(x) = x^2 - x + 6$, evaluate the difference quotient $\frac{f(a+h) - f(a)}{h}$.

- a. h
- b. $2a - h - 6$
- c. $2a - 6$
- d. $2a + h - 6$
- e. none of these

ANS: E PTS: 1 DIF: Medium REF: 1.1.22

MSC: Bimodal NOT: Section 1.1

6. Find the domain of the function.

$$f(x) = \frac{7x + 4}{x^3}$$

a. $(-\infty, 0) \cup (0, \infty)$

b. $(-\infty, 0)$

c. $\left(-\infty, -\frac{4}{7}\right) \cup \left(-\frac{4}{7}, \infty\right)$

d. $\left(-\infty, \frac{4}{7}\right) \cup \left(\frac{4}{7}, \infty\right)$

ANS: A

PTS: 1

DIF: Easy

REF: 1.1.25

MSC: Bimodal

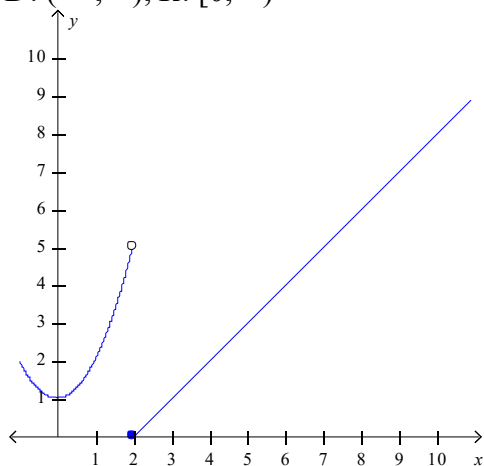
NOT: Section 1.1

7. Find the domain and sketch the graph of the function. What is its range?

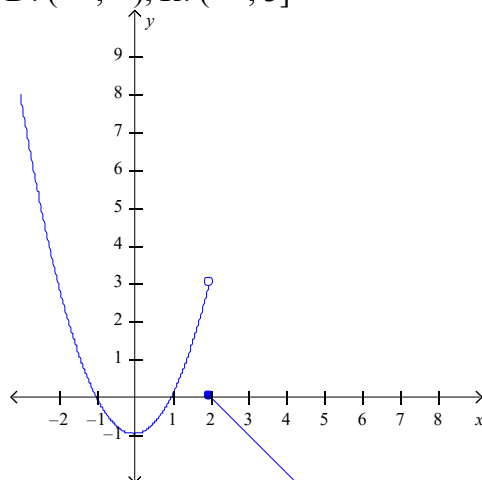
$$\begin{cases} -x + 2 & \text{if } x \geq 2 \\ x^2 - 1 & \text{if } x < 2 \end{cases}$$

$$f(x) =$$

a. $D: (-\infty, \infty); R: [0, \infty)$

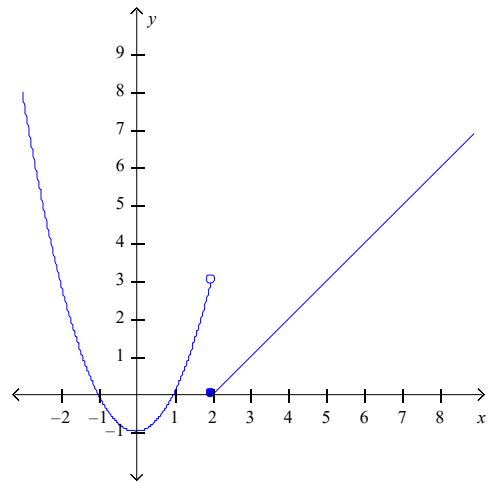
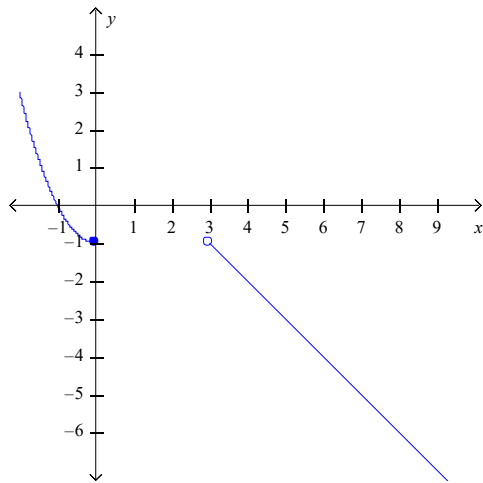


c. $D: (-\infty, \infty); R: (-\infty, 3]$



b. $D: (-\infty, \infty); R: (-\infty, 0] \cup (3, \infty)$

d. $D: (-\infty, \infty); R: [-1, \infty)$



ANS: C PTS: 1 DIF: Medium REF: 1.1.39
 MSC: Bimodal NOT: Section 1.1

8. Find an expression for the function $y = f(x)$ whose graph is the bottom half of the parabola $x + (6 - y)^2 = 0$.

- a. $y = 36 - \sqrt{-x}$
- b. $y = 6 - x^2$
- c. $y = 6 - \sqrt{-x}$
- d. $y = 6 + \sqrt{x}$
- e. $y = 36 - x^2$

ANS: C PTS: 1 DIF: Medium REF: 1.1.45
 MSC: Bimodal NOT: Section 1.1

9. A rectangle has perimeter 14 m. Express the area of the rectangle as a function $A(l)$ of the length l of one of its sides.

- a. $A(l) = 14l - l^2$
- b. $A(l) = 14l + l^2$
- c. $A(l) = 7l + l^2$
- d. $A(l) = l - 7l^2$
- e. $A(l) = 7l - l^2$

ANS: E PTS: 1 DIF: Medium REF: 1.1.47
 MSC: Bimodal NOT: Section 1.1

10. An open rectangular box with volume 2 m^3 has a square base. Express the surface area of the box as a function $S(x)$ of the length x of a side of the base.

a. $S(x) = 2x^2 + \frac{-2}{x^2}$

b. $S(x) = x^2 + \frac{-2}{x^2}$

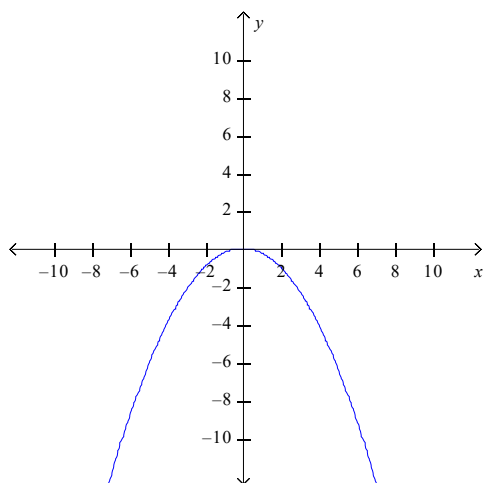
c. $S(x) = 2x + \frac{-2}{x}$

d. $S(x) = x^2 + \frac{8}{x}$

e. $S(x) = x^2 + \frac{8}{x^2}$

ANS: D PTS: 1 DIF: Medium REF: 1.1.51
 MSC: Bimodal NOT: Section 1.1

11. Determine whether the function whose graph is given is even, odd, or neither.



- a. Even
- b. Neither
- c. Odd

ANS: A PTS: 1 DIF: Medium REF: 1.1.55
 MSC: Bimodal NOT: Section 1.1

12. If the point $(7, 3)$ is on the graph of an even function, what other point must also be on the graph?

- a. $(-7, 3)$
- b. $(7, -3)$
- c. $(0, 0)$
- d. $(-7, -3)$

e. None of these

ANS: A

PTS: 1

DIF: Medium

REF: 1.1.57a

MSC: Bimodal

NOT: Section 1.1

13. Which of the following graphs is neither even nor odd?

a. $f(x) = x^3 - 9x$

b. $f(x) = \frac{4x^2}{x^4 + 1}$

c. $f(x) = 8x^3 + 10x^2 + 1$

ANS: C

PTS: 1

DIF: Medium

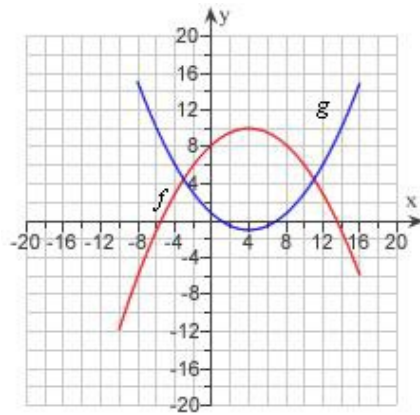
REF: 1.1.60

MSC: Bimodal

NOT: Section 1.1

NUMERIC RESPONSE

1. The graphs of $f(x)$ and $g(x)$ are given.
Find the values of $f(-4)$ and $g(3)$.



ANS: $f(-4) = 3, g(3) = -1$

PTS: 1

DIF: Medium

REF: 1.1.4a

MSC: Numerical Response

NOT: Section 1.1

2. Find the domain of the function.

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

$$\left\{ x \mid x \neq \frac{1}{3} \right\}$$

ANS:

PTS: 1 DIF: Medium REF: 1.1.26
 MSC: Numerical Response NOT: Section 1.1

3. Find the domain of the function.

$$f(x) = \sqrt{36 - 2x^2}$$

ANS: $[-6, 6]$

PTS: 1 DIF: Medium REF: 1.1.27
 MSC: Numerical Response NOT: Section 1.1

4. Determine whether f is even, odd, or neither.

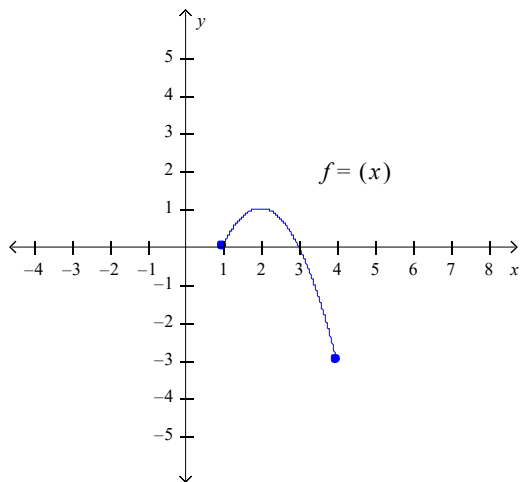
$$f(x) = \frac{8x^2}{x^4 + 5}$$

ANS: even

PTS: 1 DIF: Medium REF: 1.1.56
 MSC: Numerical Response NOT: Section 1.1

SHORT ANSWER

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



- a. Find $f(1)$.
- b. Find the value of x for which (i) $f(x) = 1$ and (ii) $f(x) = 0$.
- c. Find the domain and range of f .

ANS:

a. 0

b. (i) 2 **(ii)** 1, 3

c. D : $[1, 4]$, **R :** $[-3, 1]$

PTS: 1

DIF: Easy

REF: 1.1.3a

MSC: Short Answer

NOT: Section 1.1

2. If $f(x) = \begin{cases} x^2 + 3 & \text{if } x \leq 0 \\ \sqrt{x} & \text{if } x > 0 \end{cases}$

find $f(-4)$, $f(0)$, and $f(1)$.

ANS:

$$f(-4) = 19, f(0) = 3, f(1) = 1.$$

PTS: 1

DIF: Easy

REF: 1.1.19

MSC: Short Answer

NOT: Section 1.1

3. Determine whether the function is even, odd, or neither.

$$f(x) = 5x^3 + 7x$$

ANS:

Odd

PTS: 1

DIF: Medium

REF: 1.1.63

MSC: Short Answer

NOT: Section 1.1