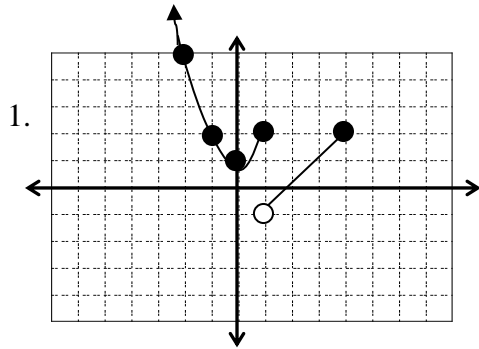


Unit 1 Review Key



- | | |
|----------------|---------------|
| a. $f(-1) = 2$ | b. $f(2) = 0$ |
| c. $f(1) = 2$ | d. $f(4) = 2$ |

2. Describe how the graph of $g(x)$ can be obtained from the graph of $f(x) = \sqrt{x}$.

- a. $g(x) = \frac{1}{2}\sqrt{x} - 1$ down 1 unit, vert. compressed by a factor of $1/2$
- b. $g(x) = -\sqrt{x-2}$ right one unit, flipped over the x axis
- c. $g(x) = 2\sqrt{3x+12}$ left 4 units, horiz. compressed by a factor of $1/3$, vert. stretched by a factor of 2.

3. $f(x) = (4x+12)^3 + 1$

4. a. $(-\infty, \infty)$ b. $[-2, \infty)$ c. $(-\infty, \frac{1}{2}) \cup (\frac{1}{2}, \infty)$ d. $[0, 4) \cup (4, \infty)$

5. a. $x^2 + x + 1$ b. $-x^2 + x - 5$ c. $x^3 - 2x^2 + 3x - 6$ d. $\frac{x-2}{x^2+3}$

$(-\infty, \infty)$ $(-\infty, \infty)$ $(-\infty, \infty)$ $(-\infty, \infty)$

6. a. $(f \circ g)(x) = 3\sqrt{x} - 2$ b. $(g \circ f)(x) = \sqrt{3x-2}$

$[0, \infty)$ $[\frac{2}{3}, \infty)$

c. $(h \circ f)(x) = \frac{\sqrt{3x}}{3x-5}$ d. $(f \circ g)(9) = 7$

$[0, \frac{5}{3}) \cup (\frac{5}{3}, \infty)$

7. a. $f(x) = 3x^6 - 5x^4$

Even

b. $f(x) = x^2 + 2$

Even

c. $f(x) = x^{101} + 11x$

Odd

8. a) symmetric to the line $y = x$

(2,-1) (-8, 5) (6, 4) (-7, -3)

c) symmetric to the origin

(1, -2) (-5, 8) (-4, -6) (3, 7)

b) symmetric to the x-axis

(-1, -2) (5, 8) (4, -6) (-3, 7)

d) symmetric to the line $y = -x$

(-2,1) (8, -5) (-6, -4) (7, 3)

9. a. $f(x) = 2x^2 - 1$

$$f^{-1}(x) = \pm \sqrt{\frac{x+1}{2}}, \text{ no}$$

b. $f(x) = \sqrt{3x+4}$

$$f^{-1}(x) = \frac{x^2 - 4}{3}, \text{ yes}$$

c. $f(x) = x - 1$

$$f^{-1}(x) = x + 1, \text{ yes}$$

10. a. yes b. no

11. $(f \circ g)(x) =$ so $g(x) = (x - 2)^2$ and $f(x) = \frac{1}{x}$

12. a. The composite $N(T(t))$. What does this function represent? The number of bacteria present in food that has been taking out of the refrigerator for a certain amount of time (t).

b. The number of bacteria in the food when $t = 2$ hours. 1700

c. The time when the bacteria count reaches 2000. 2.222

13. a. $f(0) = 3$ $f(-6) = -3$

b. positive

c. -3, 5, 8

d. 3 times

e. 3

f. $[-6, 8]$

g. $[-3, 4]$

h. $(-3, 5)$

i. $(-6, 2) \cup (7, 8)$

j. $(2, 7)$

14. a. $A(x) = \frac{1}{2}(x)\sqrt{16 - x^2}$

b. (0, 4)