

1. Does the table describe a function?

Input value	2001	2002	2003	2004	2005
Output value	20	50	20	40	30

2. Does the equation $y = x^2 + 5$ represent y as a function of x ? Why or why not?
 3. Evaluate the function at the specified value of the independent variable and simplify.
 $g(x) = 2x - 9$ $g(5+a)$

4. Find the domain of the function.

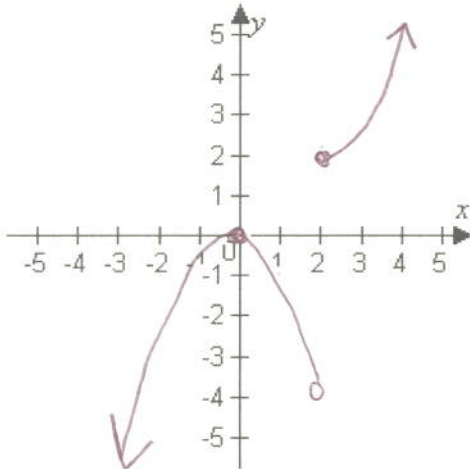
$$f(s) = \frac{-5s}{s-7}$$

5. Find the difference quotient and simplify your answer.

$$f(w) = -6w^2 + 6w, \quad \frac{f(x+h) - f(x)}{h}, h \neq 0$$

6. Determine the intervals over which the function is increasing, decreasing, or constant.

$$f(x) = \begin{cases} -x^2 & x < 2 \\ x^2 - 2x + 2 & x \geq 2 \end{cases}$$



7. Graph the function?

$$f(x) = \begin{cases} -3x, & x < 0 \\ x-3, & x \geq 0 \end{cases}$$

8. Describe the sequence of transformations from the related common function $f(x) = x^3$ to $g(x) = 2(x-4)^3$
 9. Describe the sequence of transformations from the related common function $f(x) = \sqrt{x}$ to $g(x) = -\sqrt{x} + 3$
 10. Find $(f+g)(x)$.
 $f(x) = -3x^2 - 6x - 6$ $g(x) = -5x^2 + 4x + 1$

11. Find $f \circ g$.

$$f(x) = x + 3 \quad g(x) = \frac{9}{x^2 - 9}$$

12. Find the inverse function of $f(x) = 3x + 6$

13. Determine whether the function has an inverse function. If it does, find the inverse function. $f(x) = x^2 + 5$

14. Write an equation for the function that is described by the following characteristics: the shape of $f(x) = \lfloor x \rfloor$, but reflected in the y -axis, moved six units down

Answer Key

1. yes, Each input is matched with exactly one output

2. yes, each x is matched with exactly one y

3. $2a + 1$

4. all real numbers $s \neq 7$

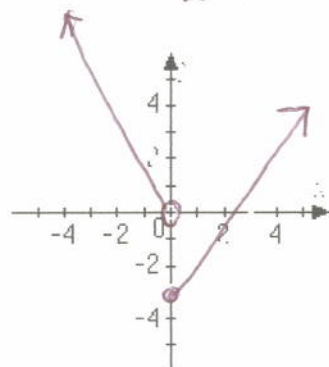
5. $-12x - 6h + 6$

6. increasing on $(-\infty, 0)$

decreasing on $(0, 2)$

increasing on $[2, \infty)$

7.



8. horizontal shift 4 units right; then vertical stretch by a factor of 2

9. reflection in the x -axis; then vertical shift 3 units up

10. $(f + g)(x) = -8x^2 - 2x - 5$

11. $(f \circ g)(x) = \frac{3x^2 - 18}{x^2 - 9}$

12. $g(x) = \frac{x - 6}{3}$

13. No inverse function exists.

14. $g(x) = \lfloor -x \rfloor - 6$