

## Exercise Set 1.1: An Introduction to Functions

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Find the domain of each of the following functions.  
Then express your answer in interval notation.

1.  $f(x) = \frac{5}{x-3}$

2.  $f(x) = \frac{x-6}{x+1}$

3.  $g(x) = \frac{x-4}{x^2-9}$

4.  $f(x) = \frac{3x+1}{x^2+4}$

5.  $f(x) = \frac{x^2+6x+5}{x^2-11x+28}$

6.  $g(x) = \frac{3x+15}{x^2+8x-20}$

7.  $f(x) = \frac{2}{\sqrt{x-4}}$

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

9.  $g(x) = \sqrt{x+7}$

10.  $F(x) = \frac{\sqrt{3-2x}}{x+4}$

11.  $G(x) = \frac{\sqrt{x-3}}{x-7}$

12.  $g(x) = \frac{-3}{\sqrt{x^2-4}}$

13.  $f(x) = |x^2 - 4|$

Evaluate the following.

14. If  $f(x) = 5x - 4$ , find:

$f(3)$ ,  $f(-\frac{1}{2})$ ,  $f(a)$ ,  $f(a+3)$ ,  $f(a)+3$ ,  $f(a)+f(3)$

15. If  $f(x) = \frac{2+x}{x-3}$ , find:

$f(-7)$ ,  $f(0)$ ,  $f(\frac{3}{5})$ ,  $f(t)$ ,  $f(t^2-3)$

16. If  $g(x) = x^2 - 3x + 4$ , find:

$g(0)$ ,  $g(-\frac{1}{4})$ ,  $g(x+5)$ ,  $g(\frac{1}{a})$ ,  $g(3a)$ ,  $3g(a)$

## Transformations of Functions – Extra Practice

Write an equation for a function that has a graph with the given characteristics.

1. The shape of  $y = x^2$  but is shifted left 3 units
2. The shape of  $y = \sqrt{x}$  but upside down and shifted right 3 units and up 4 units.
3. The shape of  $y = |x|$  but stretched vertically by a factor of 2 and shifted right 3 units.
4. The shape of  $y = x^2$  but upside-down and shifted right 8 units
5. The shape of  $y = |x|$  but stretched horizontally by a factor of 2 and shifted down 5 units
6. The shape of  $y = x^3$  but reflected across the x-axis and shifted up 1 unit.
7. The shape of  $y = \sqrt{x}$  but reflected across the y axis, shifted down 2, and left 4.
8. The shape of  $y = x^2$  but compressed vertically by a factor of 2 and shifted up 6.