Exercise:

1. Is the relationship $\{(3,2),(-1,3),(2,0),(4,2)\}$ a function? If yes, state its domain and range. If no, explain why not.

2. Is the relationship $\{(0,2),(2,0),(1,5)\}$ a function? If yes, state its domain and range. If no, explain why not.

3. Is the relationship $\{(-1,5),(3,5),(10,5),(13,5),(17,5)\}$ a function? If yes, state its domain and range. If no, explain why not.

4. Is the relationship $\{(1,3),(2,6),(1,7),(-7,0)\}$ a function? If yes, state its domain and range. If no, explain why not.

5. For the given function f and g, evaluate $f(1)$, $f(x+1)$, $f(g(x))$, and $g(f(x))$:

a. $f(x) = 2x+3, \quad g(x) = x^2$

b. $f(x) = \dfrac{2}{x}, \quad g(x) = x-1$

c. $f(x) = x^3 - 2, \quad g(x) = \sqrt[3]{x+2}$

6. Is the function $f(x) = x^4$ a one-to-one function? Explain.

7. What is the domain and range of the function $f(x) = 4x-3$?

8. What is the domain and range of the function $f(x) = \sqrt{x+1}$?

9. If f is the function defined by:

$$\begin{array}{ccc} & f: & \\ 5 & \to & 5 \\ 2 & \to & -3 \\ -1 & \to & 10 \\ 4 & \to & 6 \\ 0 & \to & 8 \end{array}$$

Find the/an inverse of f. Does the inverse of f that you defined completely recovers all the values in the domain of f? Can you define more than one inverse of f?

10. If f is the function defined by:

$$
\begin{array}{ccc}
 & f: & \\
1 & \to & 1 \\
-2 & \to & 12 \\
3 & \to & 1 \\
11 & \to & -5 \\
6 & \to & 0 \\
7 & \to & 1 \\
8 & \to & -2
\end{array}
$$

Find the/an inverse of f. Does the inverse of f that you defined completely recovers all the values in the domain of f? Can you define more than one inverse of f?

11. Find the inverse of the given function:

a. $f(x) = \sqrt{x-1}$

b. $f(x) = 3x - 1$

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

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

e. $f(x) = e^{3x} - 4$

f. $f(x) = \ln(5x+1) - 2$