

3.6 Functions

Solutions

Decide if the mapping represents a function or not a function.	
<p>1.</p> $1 \longrightarrow 3$ $2 \longrightarrow 4$ $3 \longrightarrow 5$ $4 \longrightarrow 6$ <p style="text-align: center;">function</p>	<p>2.</p> $2 \longrightarrow 1$ $1 \longrightarrow \frac{1}{2}$ $0 \longrightarrow 0$ $-1 \longrightarrow -\frac{1}{2}$ $-2 \longrightarrow -1$
<p>3.</p> $0 \longrightarrow 1$ $1 \longrightarrow 3$ $-1 \begin{cases} \longrightarrow -1 \\ \longrightarrow 1 \end{cases}$ <p style="text-align: center;">not a function</p>	<p>4.</p> $0 \longrightarrow 0$ $1 \begin{cases} \longrightarrow 1 \\ \longrightarrow -1 \end{cases}$ $4 \begin{cases} \longrightarrow 2 \\ \longrightarrow -2 \end{cases}$
<p>5.</p> $x \longrightarrow y$ $1 \longrightarrow 8$ $4 \begin{cases} \longrightarrow 6 \\ \longrightarrow 6 \end{cases}$ $8 \begin{cases} \longrightarrow 6 \\ \longrightarrow 6 \end{cases}$ <p style="text-align: center;">function</p>	<p>6.</p> $x \longrightarrow y$ $1 \longrightarrow -5$ $4 \begin{cases} \longrightarrow -3 \\ \longrightarrow -3 \end{cases}$ $8 \begin{cases} \longrightarrow -3 \\ \longrightarrow -3 \end{cases}$
<p>7. $\{(0, 3), (1, 4), (2, 5), (1, 2), (2, 0)\}$</p> <p style="text-align: center;">not a function</p>	<p>8. $\{(-2, -7), (-1, 4), (0, 1), (-2, 2), (2, 3)\}$</p>
<p>9. $\{(-3, 3), (-2, 2), (-1, 1), (0, 0), (1, 1)\}$</p> <p style="text-align: center;">function</p>	<p>10. $\{(-2, -7), (-1, -4), (0, -1), (1, 2), (2, 5)\}$</p>
<p>Answers: 1. function; 3. not a function; 5. function; 7. not a function; 9. function</p>	

Thinking of x as the input value to the function, describe what the function does to the input.	
<p>11. $f(x) = 3x$</p> <p>The function multiplies the input value by 3.</p>	<p>12. $f(x) = x + 8$</p>
<p>13. $f(x) = -5(x+2)$</p> <p>The function adds 2 to the input value and multiplies the sum by -5.</p>	<p>14. $f(x) = 4x - 1$</p>
Using x to represent the input value, write an algebraic expression for the function	
<p>15. This function multiplies the input value by negative four.</p> <p>$f(x) = -4x$</p>	<p>16. This function subtracts eight from the input value.</p>
<p>17. This function cubes the input value and then subtracts four from the result.</p> <p>$f(x) = x^3 - 4$</p>	<p>18. This function subtracts two from the input value and then multiplies the result by nine.</p>
Answers: 11. This function multiplies the input by 3; 13. This function adds 2 to the input and multiplies the result by -5 ; 15. $f(x) = -4x$; 17. $f(x) = x^3 - 4$	

Using the given functions, evaluate the functions at the given values.

$$f(x) = 2x - 3$$

$$g(x) = x^2 + 2x$$

$$h(x) = \frac{x+1}{3}$$

19. $f(7)$

$$f(x) = 2x - 3$$

$$f(7) = 2 \cdot 7 - 3$$

$$f(7) = 14 - 3$$

$$f(7) = 11$$

20. $f(4)$

21. $g(0)$

$$g(x) = x^2 + 2x$$

$$g(0) = 0^2 + 2 \cdot 0$$

$$g(0) = 0 + 0$$

$$g(0) = 0$$

22. $g(-3)$

23. $h(-7)$

$$h(x) = \frac{x+1}{3}$$

$$h(-7) = \frac{-7+1}{3} = \frac{-6}{3} = -2$$

24. $h(0)$

25. $f(1.5)$

$$f(x) = 2x - 3$$

$$f(1.5) = 2 \cdot 1.5 - 3$$

$$f(1.5) = 3 - 3$$

$$f(1.5) = 0$$

26. $f(-1.2)$

Answers: 19. $f(7) = 11$; 21. $g(0) = 0$; 23. $h(-7) = -2$; 25. $f(1.5) = 0$