

Day 2 – Function Notation & Evaluation – Notes

Learning Goal: I can understand and explain what function notation means. 0 1 2 3 4
 I can evaluate a function in function notation. 0 1 2 3 4

The following problems are written in function notation.

$$f(x) = 3x + 1 \quad f(x) = x^2 + 3x - 1 \quad f(x) = 2x^2 + x - 1$$

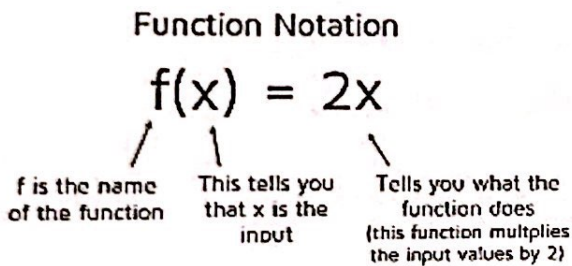
$$f(a) = 3a + 1 \quad f(\heartsuit) = \heartsuit^2 + 3\heartsuit - 1 \quad f(3) = 2(3)^2 + (3) - 1$$

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What do you think function notation means?

Whatever is in parentheses is substituted in for x.

If x is the independent variable and y is the dependent variable, then function notation for y is $f(x)$, which is read "f of x," or "the value of the function at x" where f names the function. When an equation is in two variables and it describes a function, you can use function notation to write it:



$$f(x) = x + 1$$

↑
input

$x + 1$

output

Ex. Convert the following equations into function notation.

a. $y = 5x + 7$

$$f(x) = 5x + 7$$

b. $g = 8h - 2$

$$f(h) = 8h - 2$$

c. $b = -4d$

$$f(d) = -4d$$

Evaluating Functions

When you want to know the output of a function, you can use your input values by substituting them into your function for the independent variable.

Evaluating Functions

$$F(x) = x + 1$$

$$F(2) = 2 + 1$$

$$F(2) = 3$$

$(2, 3)$

This is the primary purpose of function notation!

Ex. Evaluate $f(x) = 3x$ for $f(2)$.

$$f(2) = 3(2)$$

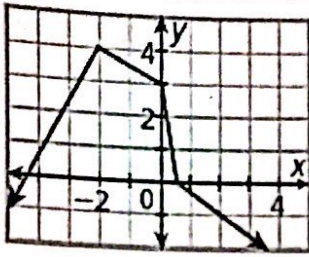
$$f(2) = 6$$

Ex. Evaluate $g(x) = \frac{1}{2}x - 3$ for $g(-4)$.

$$g(-4) = \frac{1}{2}(-4) - 3$$

$$g(-4) = -5$$

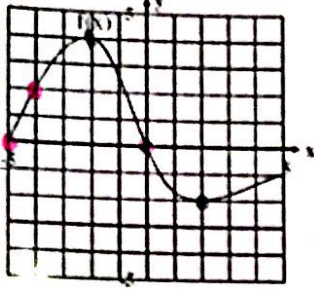
Evaluating a Function from a Graph



Can you figure out what this notation means?

$f(-2) = 4$ $(-2, 4)$ $f(0) = 3$ $(0, 3)$ This represent coordinate points
 $f(-1) = 3.5$ $(-1, 3.5)$ $f(2) = -1$ $(2, -1)$

Given this graph of $f(x)$, evaluate the following:



a. $f(-4) = 2$

b. $f(0) = 0$

c. $f(-5) = 0$

d. $f(2) = -2$

e. $f(0) = 0$

f. $f(-2) =$

Understanding Function Notation

While visiting her grandmother, Fiona found markings on the inside of a closet door showing the heights mother, Julia, and Julia's brothers and sisters on their birthdays growing up. From the markings in the closet, Fiona wrote down her mother's height each year from ages 2 to 16. Her grandmother found the measurements at birth and one year by looking in her mother's baby book. The data is provided in the table below, with heights rounded to the nearest inch.

| Age (yrs.) | x | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Height (in.) | y | 21 | 30 | 35 | 39 | 43 | 46 | 48 | 51 | 53 | 55 | 59 | 62 | 64 | 65 | 65 | 66 | 66 |

1. Which variable is the independent variable, and which is the dependent variable? Explain your choice.

independent: age
 dependent: height
 your height depends on your age.

2. What is the value of $h(11)$? What does this mean in context?

$h(11) = 62$ When Julia was 11, she was 62 inches tall.

3. When x is 3, what is the value of y ? Express this fact using function notation.

$h(3) = 39$

4. Find an x such that $h(x) = 53$. What does your answer mean in context?

$h(8) = 53$ When Julia was 8, she was 53 inches tall.

5. Find an x such that $h(x) = 65$. What does your answer mean in context?

$h(13) = 65$
 $h(14) = 65$
 When Julia was 13 and 14, she was 65 inches tall.