

Algebra 1: 3.3 Function Notation

Learning Outcomes:

- > I can use function notation to evaluate and interpret functions.
- > I can use function notation to solve and graph functions.
- > I can solve real-life problems using function notation.

Warm-up:

x	1	2	3	4	5	6	7
y	6	7	8	9	10	11	12

Can you find a pattern in the table? What would be the value of y, if x were 10? 100? Describe the pattern with an equation.

$y = 15$ $y = 105$ $x + 5 = y$

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equation notation $\rightarrow y = x + 5$
 function notation: $f(x) = x + 5$

the value of the function at x is $x + 5$

the value of "f" at x

"f" of "x"

$f(x)$ is simply another name for "y"

$g(x)$
 $h(x)$
 $k(x)$

★ note: the parentheses do not mean multiply

Linear functions: $y = mx + b$... $f(x) = mx + b$
 equation \rightarrow function

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3.3 Function Notation with work

Review from before:

$$y = 2x + 7$$

Find the value of y when $x = 3$.

SUB

$$y = 2(3) + 7$$
$$y = 6 + 7$$
$$y = 13$$

Now ... with function notation:

Evaluate the function

$$f(x) = 2x + 7 \text{ when } x = 3.$$

Or... simply, find $f(3)$. $(3, 13)$

$$f(x) \quad x = 3$$
$$f(3) = 13$$

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Example 1: Evaluate $f(x) = 2x - 7$, when $x = 4$ and $x = -4$.

$$f(4) = 2(4) - 7$$
$$= 8 - 7$$
$$f(4) = 1$$
$$(4, 1)$$

$$f(-4) = 2(-4) - 7$$
$$= -8 - 7$$
$$f(-4) = -15$$
$$(-4, -15)$$

Example 2: Let $f(t)$ be the outside temperature (degrees F), t hours

$f(t) =$

after 10 A.M. Explain the meaning of the following:

a) $f(0) = 75$

a) $t = 0$: 10am and the temperature is 75°

b) $f(3) = n$

b) $t = 3$: 1pm and the temperature is n°

c) $f(1) > f(8)$

c) $t = 1$: 11 am
 $t = 8$: 6 pm
It is hotter at 11am than at 6 pm

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3.3 Function Notation with work

Example 3: For $g(x) = \frac{1}{3}x - 2$, find the value of x for which

$g(x) = -4$ \neq $g(-4)$ $x = ?$
 $y = -4$ $x = -4$
 $g(-6) = -4$
 $(-6, -4)$
 SADMEP
 $-4 = \frac{1}{3}x - 2$
 $+2$
 $-2 = \frac{1}{3}x$
 $\times 3$
 $-6 = x$

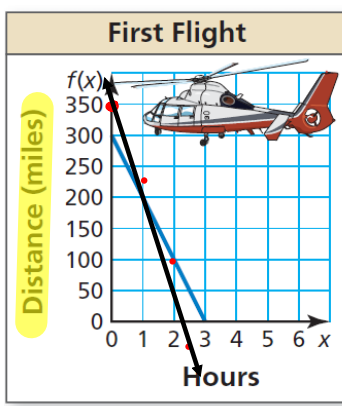
Example 4: Graph the function $f(x) = 3 - x$.

$f(x) = -x + 3$
 move $\leftarrow m = -1 = \frac{-1}{1}$ rise $\downarrow 1$
 run $\rightarrow 1$
 $b = 3$
 begin

x	3-x	f(x)
0	3-0	3 (0,3)
1	3-1	2 (1,2)
2	3-2	1 (2,1)

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Example 5:



The graph shows the number of miles a helicopter is from its destination after x hours on its first flight. On its second flight, the helicopter travels 50 miles farther and increases its speed by 25 miles per hour. The function $f(x) = 350 - 125x$ represents the second flight, where $f(x)$ is the number of miles the helicopter is from its destination after x hours. Which flight takes less time? Explain.

$b = 350$
 $m = \frac{-125}{1}$

The second flight was faster, it took less than the 3 hours of the first flight.

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3.3 Function Notation with work

3.3 pg. 125 book work

A: 1, 2, 8 - 28 (e), 33 - 38

B: 1, 2 - 30 (e), 34, 37, 38

C: 1, 4, 8, 12, 14, 16, 20, 22, 28, 37

VOCAB for Ch. 3 is due tomorrow!