September 21, 2015

Why is the concept of a function important and how do I use function notation to show a variety of situations modeled by functions?

Today's Standards

MGSE9-12.F.IF.1. Understand that a function from one set (called the domain) assigns to each element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*). (*Draw examples from linear and exponential functions.*)

MGSE9-12.F.IF.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. (*Draw examples from linear and exponential functions.*)

Function Notation

Ex1) Fiona's height from age birth to 16:

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

In function notation, h(2) means the output value when the input value is 2.
In the case of the table above, h(2) means the y-value when x is 2,
which is Fiona's height (in inches) at age 2, or 35. Thus, h(2) = 35.

Note: Function notation looks like a multiplication calculation, but the meaning is very different. To avoid misinterpretation, be sure you know which letters represent functions. For example, if g represents a function, then g(4) is not multiplication of g and 4 but is rather the value of "g at 4," that is, the output value of the function g when the input is value is 4.

Function Notation

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a. What is h(11)? What does this mean?

h(11) = **h(11) = 62 This means that when Fiona was 11 years old she was 62" tall.**

b. When x is 3, what is y? Express this fact using function notation. **y = 39 h(3) = 39**

c. Find an x so that h(x) = 53. What does your answer mean? **h(8) = 53 This means that Fiona was 53" tall when she was 8 years old.**

Function Notation

Ex2) The EHS T-shirt committee decided on a long sleeve T-shirt with a logo for Fall Fest this year. Ashley was given the job of collecting price information. She found the best price at Peachtree Plains Promotions.

The salesperson for PPP told Ashley that there would be a $50 set up fee and then $9 per shirt. If x is the number of T-shirts to be ordered for this year's Fall Fest, and y is the total dollar cost of these shirts, then y is a function of x. Using the function C(x) = 9x + 50, answer the following.

a) What is the value of C(70)? What does this mean?

C(70) = 9(70) + 50
C(70) = 680 **This means that 70 T-shirts will cost $680.**

b) What is the value of C(100)? What does this mean?

C(100) = 9(100) + 50
C(100) = 950 **This means that 100 t-shirts will cost $950.**

c) The T-shirt committee was billed a total of $1085. How many shirts were ordered if this was the total cost?

1085 = 9x + 50
1035 = 9x
x = 115 **This means that 115 shirts were ordered for a total of $1085.**

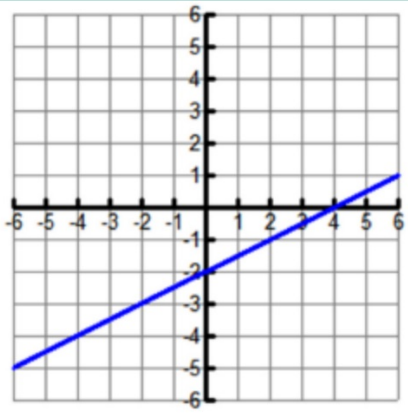
d) The T-shirt committee was billed a total of $1562. How many shirts were ordered if this was the total cost?

1562 = 9x + 50
1512 = 9x
x = 168 **This means that 168 shirts were ordered for a total of $1562.**

Function Notation

Complete the following given the graph or table.

Ex3)

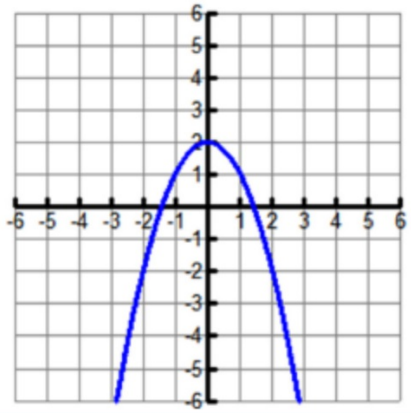


$f(-2) =$	$f(0) =$
$f(4) =$	$f(-6) =$
$f(x) = 1$	$f(x) = -4$

Function Notation

Complete the following given the graph or table.

Ex4)



f(-2) =

f(0) =

f(2) =

f(x) = -6

Function Notation

Complete the following given the graph or table.

Use the table below to answer the following.

x	2	4	6	8	10	12	14
f(x)	3	6	9	12	15	18	21

Ex5) $f(6) =$

Ex6) $f(12) =$

Ex7) $f(4) =$

Ex8) $f(x) = 6$

Ex9) $f(x) = 18$

Ex10) $f(x) = 12$

Complete Class Practice Handout

Use the table to answer questions 1 – 6.

x	0	1	2	3	4	5	6	7	8	9	10
$f(x)$	12	17	20	25	30	34	37	39	46	49	54

1) f(2) = 20

2) f(8) = 46

3) f(5) = 34

4) f(1) = 17

5) f(4) = 30

6) f(10) = 54

Use the following scenario for questions 7 – 10.
SGA is selling travel mugs to raise money for Prom. The senior representatives figure they will sell at least 200 but no more than 600 travel mugs. Cherokee Embroidery has provided the cost for that range. They are charging a onetime fee of $25 for the logo imprint and $5 per travel mug. Use C(x) = 5x + 25 for the cost function.

7) What is the value of C(250)? What does this mean?

$C(250) = 5(250)+25$
$= 1250+25 = \$1275$

8) What is C(400)? What does this mean?

$C(400) = 5(400)+25:$
$2000+25 = \$2025$

9) The Prom committee was billed a total of $1085. How many travel mugs were ordered if this was the total cost?

$1085 = 5X+25$
$1060 = 5X$
$X = 212$ mugs

10) The Prom committee was billed a total of $2775. How many travel mugs were ordered if this was the total cost?

$2775 = 5X+25$
$2750 = 5X$
$X = 550$ mugs

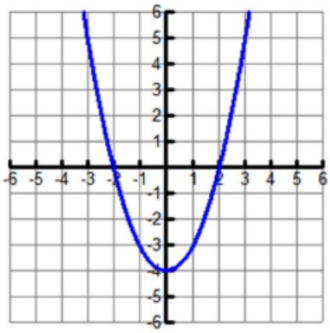
Use the graph to answer questions 11 – 14.

11) f(-2) = 0

12) f(0) = -4

13) f(-1) = -3

14) f(1) = -3



Homework: Quiz Review