Your Name

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11/4/2020

Notes

LESSON 3-2

FUNCTION NOTATION

Objective: To be able to write an equation in function notation and understand how to substitute numbers and expressions in for the domain to find the range value.

Life Lesson/Skill: When we start graphing functions we need to understand how any number can be a domain possibility and expressions are just complicated ways to write numbers. A point is described by two things, its domain and range, like "taking the bus" could be described by accessibility and speed.

Function Notation

uses f(x) where f is the name of the function, and the x is the variable that we are substituting in for that will change

Equation	Function Notation
y= 2x - 5	f(x)= 2x - 5
$A= \pi r^2$	reads: 'f of x'
	$f(r)= \pi r^2$ or $A(r)= \pi r^2$

Since a function uses its unique rule to pair a range value (y) with a domain value (x), if they replace x with a number, then they are asking you to plug that number in to the function for that variable.

f(x) = 2x - 5 ⟷ f(6) = 2(6) - 5 ⟷ f(6) = 7 means if 6 is the domain (input) then 7 will be the range (output).

In other words: when x is 6, y is 7.

(6, 7)

y = 7

f(x) = -3x - 4 what is f(-2)?

f(-2) = -3(-2) - 4

f(-2) = 6 - 4

f(-2) = 2

(x , y)

(-2, 2)

Finding f(?)

Find the value for the range using function rule and the domain given.

How? Plug in the inside value for that variable in the rule and simplify the expression

g(x) = -3x + 7 **f(x) = 2x - 5**

f(-2) = -1 g(0) = 7

needs f function rule needs g function rule

f(x) = 2x - 5

f(-2) = 2(-2) - 5

f(-2) = 4 - 5 = -1

g(x) = -3x + 7

g(0) = -3(0) + 7

g(0) = 7

Find the value of the range using 3 things:

the function rule, f(x) = 2x - 5

the domain given, and x = ? f(?)

the operation on the function. what we do after

Use brackets to separate the original equation from the other terms being listed.

f(x) = 2x - 5

f(1) + 4 = 1 2 - f(0)

[2(1) - 5] + 4

(2 - 5) + 4

-3 + 4

1

Finding f(x) = ?

When you know the y value and you are to solve for x.

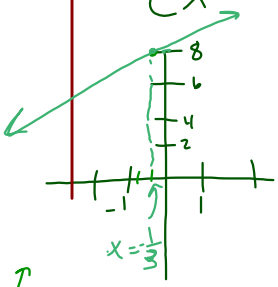
How? Plug the number in for f(x) itself.

Then solve for x like an equation.

$g(x) = 8$ means $y = 8$

this wants you to solve for x

ex



$g(x) = -3x + 7$

$8 = -3x + 7$

$-7 \quad -7$

$1 = -3x$

$\frac{1}{-3} = \frac{-3x}{-3}$

$x = -\frac{1}{3}$

$(-\frac{1}{3}, 8)$

19 $g(x) = x^2 - x$

$g(-6) = ?$

$g(x) = 6$

$-6^2 \quad (-6)^2$

$-36 \quad 36$

$-6 \cdot 6 \quad -6 \cdot -6$

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

$g(-6) = (-6)^2 - (-6)$

$g(-6) = 36 + 6$

$g(-6) = 42$

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

$6 = x^2 - x$

We will learn how to solve this later in the year.

$f(x) = -1x^2 - 3x$

$f(-3) = -1(-3)^2 - 3(-3)$

$= -9 + 9$

$f(-3) = 0$

$(-3, 0)$

Interpreting Function Notation

ex. Let f(t) be the outside temperature (°F)
t hours after 6 A.M.

What do each of the following mean?

a. f(4) = 75
t = 4
f(t) at 10 am (4 hrs after 6 am) the temperature is 75°F

b. f(m) = 60
at some time (m hrs after 6 am) the temperature is 60°F

c. f(2) < f(6)
there was a cooler temperature at 8 am (2 hr after 6 am) compared to 12 pm (6 hrs after 6 am)

Function Tables and Graphs

Use the same function rule for each value of x listed in the x column to find f(x).

Then write the pair together: (x, f(x)) or (x,y)

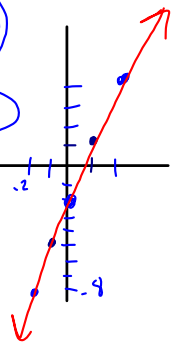
Plot and connect points to graph the function

ex. Graph f(x) = 3x - 2

Use an xy table to find the points

x	f(x) = 3x - 2	f(x)	(x, f(x))
-2	f(-2) = 3(-2) - 2 = -6 - 2	-8	(-2, -8)
-1	f(-1) = 3(-1) - 2 = -3 - 2	-5	(-1, -5)
0	f(0) = 3(0) - 2 = 0 - 2	-2	(0, -2)
1	f(1) = 3(1) - 2 = 3 - 2	1	(1, 1)
2	f(2) = 3(2) - 2 = 6 - 2	4	(2, 4)

pick 5 near values of 0

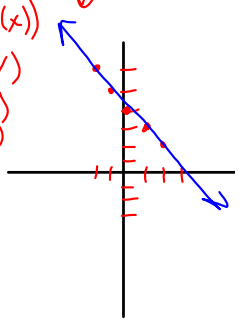


ex. Graph g(x) = -x + 4

Use an xy table to find the points

x	g(x) = -x + 4	g(x) = y	(x, y)
-2	g(-2) = -(-2) + 4 = 2 + 4	g(-2) = 6	(-2, 6)
-1	g(-1) = -(-1) + 4 = 1 + 4	g(-1) = 5	(-1, 5)
0	g(0) = -(0) + 4 = 0 + 4	g(0) = 4	(0, 4)
1	g(1) = -(1) + 4 = -1 + 4	g(1) = 3	(1, 3)
2	g(2) = -(2) + 4 = -2 + 4	g(2) = 2	(2, 2)

(x, g(x))



Summary

Objective: To be able to determine if a relation is a function or not from points, tables, and graphs. To be able to write an equation in function notation and understand how to substitute numbers and expressions in for the domain to find the range value.

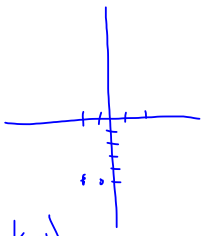
Virtue/Skill: When we start graphing functions we need to understand how any number can be a domain possibility and expressions are just complicated ways to write numbers. A point is described by two things, its domain and range, like "taking the bus" could be described by accessibility and speed.

Assignment: pg. 125 #1,2,3-19 odd

Assignment: pg. 125 #23-28 all, and 34

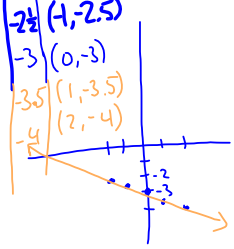
24.

x	$h(-x)=-5$	y	(x, y)
-2	$h(-2)=-5$	-5	(-2, -5)
-1	$h(-1)=-5$	-5	(-1, -5)
0			
1			
2			



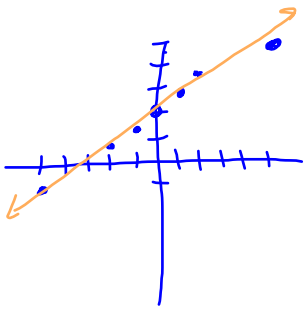
25. $d(x)=-\frac{1}{2}x-3$

x		y	(x, y)
-2	$d(-2)=-\frac{1}{2}(-2)-3=1-3$	-2	(-2, -2)
-1	$d(-1)=-\frac{1}{2}(-1)-3=\frac{1}{2}-3$	$-2\frac{1}{2}$	(-1, -2.5)
0	$d(0)=-\frac{1}{2}(0)-3=0-3$	-3	(0, -3)
1	$d(1)=-\frac{1}{2}(1)-3=-\frac{1}{2}-3$	-3.5	(1, -3.5)
2	$d(2)=-\frac{1}{2}(2)-3=-1-3$	-4	(2, -4)



26)

X	Y
-5	-1
-2	$1\frac{1}{5}$
-1	$1\frac{2}{5}$
0	2
1	$2\frac{3}{5}$
2	$3\frac{1}{5}$
5	5



28)

X	Y
-2	15
-1	9
0	3
1	-3
2	-9