Starter 9 OCT 2018

Find the value of y if x = -2.

y = 2x - 3

Function Notation Day 1

Functions can be written in two formats.

"f of x"

Y= format	F(x) format
$y = 2x$ $y = 3x^2 + 4x$ $y = \sqrt{x+4}$ $y = \frac{x}{3}$	$f(x) = 2x$ $g(x) = 3x^2 + 4x$ $k(x) = \sqrt{x+4}$ $j(x) = \frac{x}{3}$

The f(x) format is called function notation.

Function notation has two benefits over y = format.

- Gives different functions their specific "name". In other words, f(x) denotes a specific rule, and g(x) denotes a different rule.
- It can be used to designate what value to evaluate. If it is written as f(2), it means to find rule "f" and substitute in a 2.

$f(2)$

I DO: If $f(\square) = 2\square - 3$, find each of the following.

a. $f(4) = 2(4) - 3$

$8 - 3 = 5$

Steps: Substitute 4 into $\square$

a solution

Follow the order of operation to evaluate.

$(x, f(x))$

y

$\boxed{f(4) = 5}$

$f(4) =$ 5 can be written as the ordered pair (4, 5)

input

output

I DO: b. $f(-6) =$ ____

$f(\square) = 2\square - 3$

Steps: Substitute -6 into $\square$

Follow the order of operation to evaluate.

$f(-6) = 2(-6) - 3$

$-12 - 3 = -15$

$f(6) = \underline{-15}$

$f(6) = \underline{-15}$ can be written as the ordered pair $\underline{(-6, -15)}$

WE DO Given $g(x) = x^2 + 5$

Find $g(3) = (3)^2 + 5$

$9 + 5 = 14$

Steps: Substitute 3 into x **in ( )

Follow the order of operation to evaluate.

$g(3) = \underline{14}$

$g(3) = \underline{14}$ can be written as the ordered pair $\underline{(3, 14)}$

***Note:** $f(-4) = -3$ $\boxed{\text{does not}}$ say to multiply $f \bullet -4$

It says that -4 is the input and -3 is the output.

It says that (-4,-3) is an ordered pair.

x — independent variable

y, f(x) — dependent Variable

$\boxed{f(x) = -2x + 3}$

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

$-4 + 3 = -1$

$\boxed{f(2) = -1}$ $\boxed{(2, -1)}$

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

$2 + 3 = 5$

$\boxed{f(-1) = 5}$ $\boxed{(-1, 5)}$

Reminders:

I. $f(x) = 6x - \frac{10}{x}$

input — X — iv

output — y — dv

f(x)

name

II. $f(-3) = 4$ is read "f" of -3 equals 4. ****Does not read $f\ times - 3$.

III. $f(-3) = 4$ can also be written as $-3 \to 4$ or as the ordered pair (-3,4).

IV. To evaluate:

Given $f(x) = 6x - \frac{10}{x}$, find $f(-2)$.

Step 1: Substitute (-2) for each x .

$$\boxed{f(-2) = 6(-2) - \frac{10}{(-2)}}$$

Step 2: Perform the order of operations.

$$\boxed{\begin{aligned} f(-2) &= -12 - (-5) \\ f(-2) &= -12 + 5 \\ f(-2) &= -7 \end{aligned}}$$

***Recall *** $f(-2) = -7$ can be written as a mapping $-2 \to -7$ or as an ordered pair (-2,-7)

PRACTICE WORK ON BACK

1. Given $g(x) = 3x - 7$, find $g(4)$.

Step 1. Substitute (4) in for x. Step 2: Perform the operations.

Step 3: Write in function notation $g(4) =$ ______ Write as an ordered pair ________

Name the input value________ Name the output value________

2. Given $f(x) = 6x^2 - 2x$, find

a. $f(3)$. $f(3) =$ _______ b. $f(-1)$. $f(-1) =$ _______

b. Challenge $f\left(\frac{1}{2}\right)$. **without a calculator** $f\left(\frac{1}{2}\right) =$ _____.

3. $h(x) = \frac{2x+3}{5}$

a. $h(6)$. $h(6) =$ _______ b. $h(0)$. $f(0) =$ _______

4. Complete the table.

X –input	Function rule $f(x) = -2x + \frac{8}{x}$	F(x) or Y output
-3		
$\frac{1}{2}$		
5		