What is Function Notation?

- Another way to write $y=$

- Instead of writing $y = x^2 + 1$

  Function Notation writes it as: $f(x) = x^2 + 1$

- How do you say "f(x)"? "f of x"

- f is the function name

- x is the independent variable (domain)

Given: $y = x^2 + 1$

Find the value of y when x = 5

$$y = (5)^2 + 1$$
$$= 25 + 1$$
$$y = 26$$

Find the value of the function when you substitute 5 for x (the independent variable).

Given: $f(x) = x^2 + 1$

Find f(5) $= (5)^2 + 1$
$= 25 + 1$
$f(5) = 26$

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

a) Find $f(3) = 9$

$$2(3)^2 - 3(3)$$
$$18 - 9$$
$$= 9$$

b) Find $f(-3)$

$$2(-3)^2 - 3(-3)$$

c) Find $f(Q) = 2Q^2 - 3Q$

d) Find $f(5W)$

$$2(5w)^2 - 3(5w)$$
$$50w^2 - 15w$$

Given $f(x) = 3x + 1$

1. Find f(-2) $= 3(-2) + 1 = -6 + 1 = \boxed{-5}$

2. Find x when f(x)=34   replace f(x) with 34, don't replace x with 34!

$$34 = 3x + 1$$
$$33 = 3x$$
$$\boxed{11 = X}$$

Use this function: $g(x) = 2x^2 - 3x$

1. Find g(-4)

$g(-4) = 2(-4)^2 - 3(-4)$

$g(-4) = 32 + 12$

$\boxed{g(-4) = 44}$

2. Find g(3c)

$2(3c)^2 - 3(3c)$

$2(9c^2) - 3(3c)$

$\boxed{g(3c) = 18c^2 - 9c}$

3. Find g(m+5)

$2(m+5)^2 - 3(m+5)$

$2(m^2 + 10m + 25) - 3(m+5)$

$2m^2 + 20m + 50 - 3m - 15 = \boxed{2m^2 + 17m + 35}$

Relation

A set of ordered pairs

(a bunch of points)

Function

A kind of relation where each x is paired with one and only one y.

Each input produces only one output

x values can't repeat!

Which of the following is correct?

1. **Every Relation is a Function** ✗
   Every Rectangle is a Square

2. **Every Function is a Relation** ✓
   Every Square is a Rectangle

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2. Tell if each of the following is a Function or Not a Function.
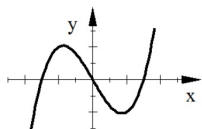
a) $(4,3), (3,-9), (6,1), (-6,3)$

Yes

b) $(\underline{-5},-2), (11,-1), (\underline{-5},6), (8,4)$
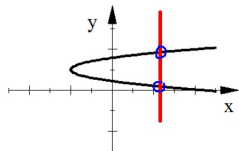
No

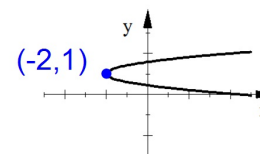Tell if each of the following is a Function or Not a Function.

c)

Yes

d)

No

This graph fails the Vertical Line test.

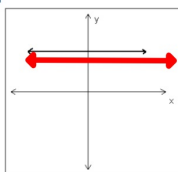State the Domain and Range of this relation:

d)

(-2,1)

Domain: $X \geq -2$

Range: $\mathbb{R}$

Is each a function:

a.

What is the Vertical Line Test?

A test to see if a graph represents a function

If any vertical line intersects a graph more than once the graph is NOT a function.

The above graph IS a function because no vertical line will every intersect it more than once.