

UNIT 1-LESSON 1 Domain, Range and Functions

A **RELATION** is a relationship between two sets of data. \longrightarrow (2,3) AND (3,3) represent a relation because they both have an x and y coordinate.

DOMAIN - the set of all potential inputs (x-value)

RANGE - the set of all potential outputs (y-value)

FUNCTION - For every value of x, there is exactly one value of f(x) \longrightarrow (2,3) (3,3) (4,3) IS A FUNCTION because the x-value does not repeat itself

(2,3) (3,5) (2, 6) IS NOT A FUNCTION because the x-value does repeat

Ex 1) Is the relation below a function?

$\{(4,-5), (1,-3), (0, 0), (1, 1), (4, 5), (9, 3)\}$



IT IS NOT A FUNCTION, the x coordinates 4 and 1 repeat more than once.

YOU TRY!!!

Ex 2) $\{(3, 6), (5, 7), (7, 7), (8, 9)\}$

Ex 3) $\{(5, -4), (3, -5), (4, -3), (3, 4)\}$

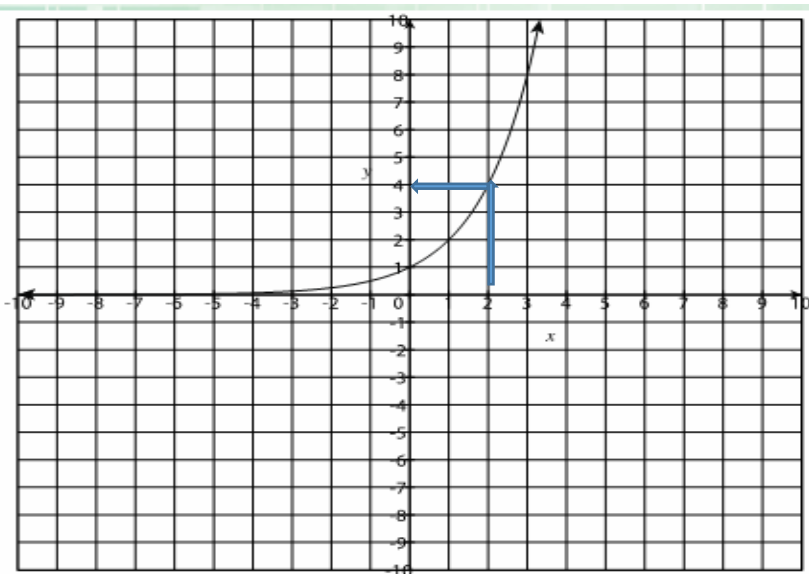
EVALUATING FUNCTIONS

Function Notation = $f(x)$

Means "f of x" not "f times x"

$(x, f(x))$ is an ordered pair of a function and a point on the graph of the function.

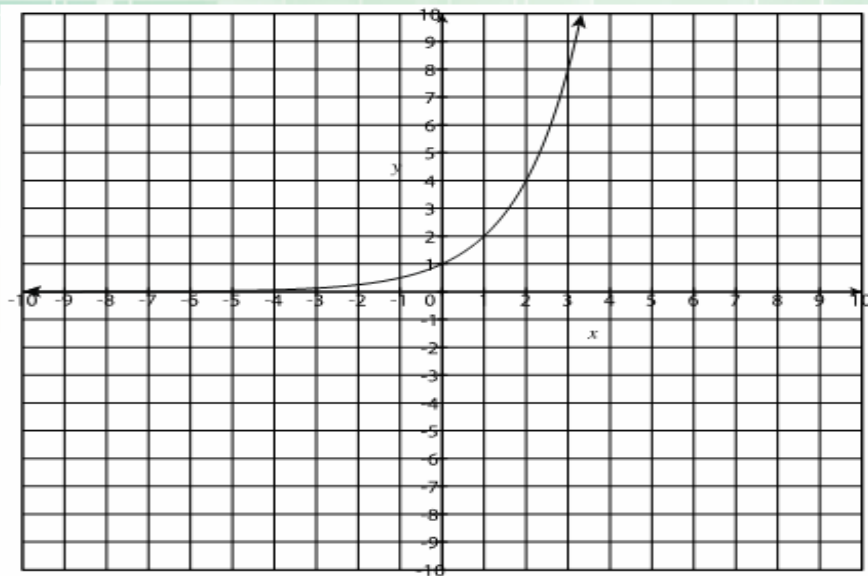
Ex 4) Given the graph, what is $f(2)$?



The number in the parenthesis is the value of x.
So $x = 2$
Find $x = 2$ on the graph
Follow $x = 2$ until it meets with the curve given
There you will find the value of y, which is the answer.
 $y = 4$

YOU TRY!!!

Ex 5) Given the graph, what is $f(3)$?



Ex 6) Evaluate $g(x) = 3^x + 1$ over the domain $\{0, 1, 2, 3\}$. What is the range?

1. To evaluate $g(x) = 3^x + 1$ over the domain $\{0, 1, 2, 3\}$, substitute the values from the domain into $g(x) = 3^x + 1$.

2. Evaluate $g(0)$.

$$g(x) = 3^x + 1 \quad \text{Original function}$$

$$g(0) = 3^0 + 1 \quad \text{Substitute 0 for } x.$$

$$g(0) = 1 + 1 = 2 \quad \text{Simplify.}$$

3. Evaluate $g(1)$.

$$g(x) = 3^x + 1 \quad \text{Original function}$$

$$g(1) = 3^1 + 1 \quad \text{Substitute 1 for } x.$$

$$g(1) = 3 + 1 = 4 \quad \text{Simplify.}$$

4. Evaluate $g(2)$.

$$g(x) = 3^x + 1 \quad \text{Original function}$$

$$g(2) = 3^2 + 1 \quad \text{Substitute 2 for } x.$$

$$g(2) = 9 + 1 = 10 \quad \text{Simplify.}$$

5. Evaluate $g(3)$.

$$g(x) = 3^x + 1 \quad \text{Original function}$$

$$g(3) = 3^3 + 1 \quad \text{Substitute 3 for } x.$$

$$g(3) = 27 + 1 = 28 \quad \text{Simplify.}$$



6. Collect the set of outputs from the inputs.

The range is $\{2, 4, 10, 28\}$.



YOU TRY!!!

Ex 7) Evaluate $f(x) = 4x - 7$ over the domain $\{1, 2, 3, 4\}$. What is the range?