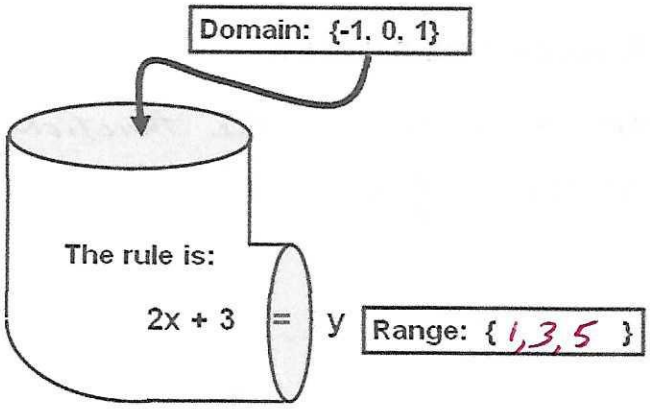
1.5 Notes: Function Notation

Build Your Vocabulary:

A FUNCTION can be a rule with input values (the x's DOMAIN) and output values (the y's RANGE).

Example 1:



Ordered Pairs:

$2(-1)+3=1$ → $(-1, 1)$

$2(0)+3=3$ → $(0, 3)$

$2(1)+3=5$ → $(1, 5)$

OR x y

Write the following equations in **function notation:**

1. $y = 4x + 6$ → $f(x) = 4x + 6$
2. $y = -4x - 9$ → $g(x) = -4x - 9$
3. $5x - 6 = y$ → $5x - 6 = h(x)$
4. $y = 2x + 3$ → $f(x) = 2x + 3$

Using FUNCTION NOTATION: $f(x) = 2x + 3$

I Do

Ex. 2: To find $f(4)$, you would replace x with 4 in the rule.

$f(x) = 2x + 3$

$f(4) = 2(4) + 3$

$f(4) = 11$ → $(4, 11)$ OR x y

We Do

Ex. 3: To find $f(-1)$, you would replace x with -1 in the rule.

$f(x) = 2x + 3$

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

$f(-1) = 1$ → $(-1, 1)$ OR x y

Example 4: Use the following equation: $f(x) = 2x + 5$

You Do

1. Find $f(2)$: 9

$f(x) = 2(x) + 5$

$f(2) = 2(2) + 5$

$f(2) = 9$ → $(2, 9)$ OR x y

2. Find $f(6)$: 17

$f(x) = 2x + 5$

$f(6) = 2(6) + 5$

$f(6) = 17$ → $(6, 17)$ OR x y

3. Find $f(-2)$: 1

$f(x) = 2(x) + 5$

$f(-2) = 2(-2) + 5$

$f(-2) = 1$ → $(-2, 1)$ OR x y

1.5 Notes: Function Notation

Example 5: Find the range (y's) of each function for the given domain (x's).

$f(x) = x^2 - 2;\ D = \{-2, 0, 2, 4\}$

$f(-2) = (-2)^2 - 2 = 2$ $(-2, 2)$

$f(0) = (0)^2 - 2 = -2$ $(0, -2)$

$f(2) = (2)^2 - 2 = 2$ $(2, 2)$

$f(4) = (4)^2 - 2 = 14$ $(4, 14)$

Range $= \{2, -2, 14\}$

Explain the connection between the domain & range in a rule (function).

The domain is the x's or the input in the function rule.
The range is the y's or the output.

Example 6: Find the values indicated.

For $h(x) = \{(-2, 6), (2, 8), (4, 10), (6, 12), (8, 14)\}$

$h(6) =$ 12

$h(-2) =$ 6

$h(x) = 8,\ x =$ 2

$h(x) = 10,\ x =$ 4

Examples: If $f(x) = 2 - 3x$ and $g(x) = 2x^2 - 1$; find the following:

$f(-2)$:

$f(x) = 2 - 3x$

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

$\boxed{f(-2) = 8}$

$g(5)$:

$g(x) = 2x^2 - 1$

$g(5) = 2(5)^2 - 1$

$\boxed{g(5) = 49}$

~~$f(11)$~~:

$f(x) = 11$

$f(x) = 2 - 3x$

$11 = 2 - 3x$

$-2 \quad -2$

$\frac{9}{-3} = \frac{-3x}{-3}$

$\boxed{-3 = x}$

$f(4) + g(-1)$:

$f(x) = 2 - 3x$

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

$f(4) = -10$

$g(x) = 2x^2 - 1$

$g(-1) = 2(-1) - 1$

$g(-1) = 1$

$-10 + 1$

$\boxed{f(4) + g(-1) = -9}$