4.2: Evaluating Functions

SWBAT identify the parts of function notation and evaluate functions at a given value.

Assignments:

HW25

Function Notation

$$\overbrace{\overbrace{\underbrace{f}_{name}\underbrace{(x)}_{input}}^{output} = \underbrace{4x^2 - 8x + 6}_{rule}}^{definition}$$

- Important notes:
  - Parentheses in the output *do not* mean multiplication
  - The variable used as the input *must* be the same variable used in the rule

Inputs and Outputs

- Often, when working with functions, we want to know what output (what object in the range) matches with a specific input (object in the domain).
- For example, if we have a function f, and we want to know what output matches with the input 3, we would write:
- $f(3)$

Evaluating Functions:
What is the output of the function for a certain input value?

- To evaluate a function, substitute the indicated value for the variable representing the input.

Ex. $g(a) = 3a + 2; \text{Find } g(2)$

1. $g(t) = 2t - 3; \text{Find } g(-1)$
2. $w(a) = 4a - 1; \text{Find } w(-10)$
3. $f(t) = 4t - 2; \text{Find } f(5)$
4. $f(t) = 2t - 4; \text{Find } f(10)$
5. $p(n) = 2n + 3; \text{Find } p(5)$
6. $f(x) = 2x + 3; \text{ Find } f(-2)$
7. $h(x) = 4x; \text{ Find } h(1)$

Evaluating Functions

- $f(x) = |2x + 2|$; Find $f(9)$

1. $h(x) = |x| + 2$; Find $h(-2)$
2. $f(n) = |n|$; Find $f(5)$
3. $g(a) = |-3a|$; Find $g(8)$
4. $p(n) = |n - 1|$; Find $p(-1)$
5. $h(t) = |-t - 2|$; Find $h(-5)$

Evaluating Functions

- $f(x) = x^2 - 3$; Find $f(-6)$

- $f(a) = a^2 - 3a$; Find $f(-3)$

1. $k(x) = x^2 - 2$; Find $k(5)$
2. $w(x) = x^2 - x$; Find $w(8)$
3. $f(n) = n^3 - 2n^2$; Find $f(5)$
4. $g(t) = t^2 - 4$; Find $g(10)$

Evaluating Functions

- In addition to evaluating at a number, we can evaluate "at an expression"
  - Instead of substituting in a number, we can substitute an expression
- Ex: $f(x) = 3x - 1;\ f(x + 2)$

1. $f(x) = 2x - 7;\ f(y + 2)$
2. $f(x) = |x - 5|;\ f(2x)$
3. $f(x) = x^2;\ f(x - 1)$
4. $f(x) = -2x + 7;\ f(-x + 4)$

Constant Functions

- These functions give the same output for every single input.
- Ex. $f(x) = 4$; Find $f(2)$ and $f(-5)$

- Ex. $f(x) = 3n - 9$; Find $f(0)$ and $f(4)$