4.3 Solving Functions

SWBAT solve linear and absolute values functions given the output.

Assignments:

HW26

Types of Functions

Linear Functions

► Functions whose biggest exponent is 1

► Graph is a line

► Examples:

  ► $f(x) = x$

  ► $f(x) = 2x - 9$

  ► $f(x) = -5x + 7$

Absolute Value Functions

► Functions whose rules include an absolute value

► Graph is a "V"

► Examples:

  ► $f(x) = |x|$

  ► $f(x) = 4|x - 6|$

  ► $f(x) = |-2x + 3|$

Solving Functions

▶ When **evaluating** functions, we had the input and were searching for the matching output.

▶ When **solving** functions, we have the output and are searching for the matching input.

▶ Example: $f(x) = 2x - 8$; $f(x) = 6$

Notice that here, instead of having x, we have $f(x)$. $f(x)$ is also a variable (if a complicated one); we're going to replace it entirely with 6

Solving Linear Functions

- $f(x) = 3x - 5; f(x) = 4$

1. $f(x) = 2x - 5; f(x) = 6$
2. $f(w) = -w + 3; f(w) = -4$
3. $g(x) = 12x + 81; g(x) = 57$
4. $h(x) = 2(x - 6); h(x) = -2x$

- $f(x) = 2x - 1; f(x) = x + 1$

Solving Absolute Value Functions

- $f(n) = |n - 5|; f(n) = 14$

- $f(x) = |3x + 2|; f(x) = 10$

1. $g(x) = |x + 8|; g(x) = 37$
2. $m(x) = |4x + 1|; m(x) = -17$
3. $j(x) = |-x - 1|; j(x) = 20$
4. $f(x) = \left|\frac{x}{3} + 2\right|; f(x) = 0$
5. $f(v) = \left|\frac{v+9}{2}\right|; f(v) = 15$
6. $g(x) = |3x + 4|; g(x) = 17$
7. $p(x) = |x - 4|; p(x) = -19$
8. $w(x) = |-x|; w(x) = 15$

Solving Absolute Value Functions

- $f(x) = |x - 4|; f(x) = 3$

1. $f(x) = |3x - 7|; f(x) = 2$
2. $f(x) = |3x - 8|; f(x) = -7$
3. $f(x) = |2x + 19|; f(x) = 18$
4. $f(x) = |x - 2| + 9; f(x) = 17$
5. $f(x) = |-x - 6| - 4; f(x) = 0$

- $f(x) = 2|x - 6|; f(x) = 16$

Absolute Value Equations

- |____| = (+): 2 solutions
- |____| = 0: 1 solution
- |____| = (−): No solutions

- The number of solutions is the same as the number of equations that are written

- Adding/Subtracting *inside* the absolute value results in solutions that are completely different numbers
- What is inside the absolute value *never changes*
- Absolute value counts as "parentheses" in SADMEP