Day 29: Using Function Notation to Solve Problems

Last class we learned about function notation as a way to communicate which equation or line we are talking about. Remember that we named Ian Maurer's equation I(x) (pronounced "I of x"), Ellen Maiden's equations E(x) (pronounced "E of x") and Chelsea Muhs' equation as C(x) (pronounced C of x).

We can use function notation to solve problems. For example, if you have a function **f(x) = 2x + 3**, and you want to know what f(x) is equal to when x equals 5, you write it like this-- Find f(5):

$f(5) = 2(5) + 3$

$10 + 3 = 13$

If you know a certain **y-value** and want to find the corresponding x-value, you can also use function notation. Let's say you want to know what x is when y = 45, you write if like this -- Solve f(x) = 45:

$2x + 3 = 45$

$-3 \quad -3$

$\frac{2x}{2} = \frac{42}{2}$ → $x = 21$

Let's apply these skills to solve problems about "The Big Race":

During Heat 2, Chelsea Muhs' run could be modeled with the equation C(x)= 5x - 10, because she could run 5 yards per second, and she started 10 yards behind the starting line. Remember, **x** represents the time in seconds, and **C(x)**, or y, represents the distance in yards.

1. What was her distance after 20 seconds of running?

$C(20) = 5(20) - 10$

$100 - 10$

$C(20) = 90$

2. Find C(23).

$C(23) = 5(23) - 10$

$115 - 10$

$C(23) = 105$

3. Find C(40).

$C(40) = 5(40) - 10$

$200 - 10$

$C(40) = 190$

4. What does the result mean of #3?

After 40 seconds, Ms. Muhs is 190 yards into the race.

5. How many seconds will it take her to run 95 meters?

$5x - 10 = 95$

$+10 \quad +10$

$\frac{5x}{5} = \frac{105}{5}$ → $x = 21$

6. Solve C(x) = 25

$5x - 10 = 25$

$+10 \quad +10$

$\frac{5x}{5} = \frac{35}{5}$ → $x = 7$

7. What does the result mean of #6?

After 7 seconds, the runner is 25 yards.

Use these two functions for the following problems: f(x) = 12x + 1 and g(x) = -4x + 8

8. Find f(4).

$f(4) = 12(4) + 1$

$48 + 1$

$f(4) = 49$

9. Find f(-3).

$f(-3) = 12(-3) + 1$

$-36 + 1$

$f(-3) = -35$

10. Find g(4).

$g(4) = -4(4) + 8$

$-16 + 8$

$g(4) = -8$

11. Find g(-3).

$g(-3) = -4(-3) + 8$

$12 + 8$

$g(-3) = 20$

12. Solve f(x) = 25

$12x + 1 = 25$

$-1 \quad -1$

$\frac{12x}{12} = \frac{24}{12}$

$x = 2$

13. Solve g(x) = -36

$-4x + 8 = -36$

$-8 \quad -8$

$\frac{-44}{-4} = \frac{-44}{-4}$

$x = 11$

14. Solve g(x) = 10

$-4x + 8 = 10$

$-8 \quad -8$

$\frac{-4x}{-4} = \frac{2}{-4}$

$x = -\frac{1}{2}$

15. Solve f(x) = 10

$12x + 1 = 10$

$-1 \quad -1$

$\frac{12x}{12} = \frac{9}{12}$

$x = \frac{3}{4}$