Function Notation

Two phone companies, A and B, charged their customers $20 per month plus 10 cent per call and $10 per month plus 20 cents per call respectively.

Using our current notation, we would use x and y to describe the relationships

Their rates would be for A $y = .10x + 20$

and for B $y = .20x + 10$

That could be confusing because their costs are both being described as y. So it might be better if we wrote those relationships with different identifiers.

$$A = .10x + 20$$

$$B = .20x + 10$$

That seems to make sense.

To find the cost of making 80 phone calls, I would need to find the value of A or B when x was 80.

I'd have to write a sentence.

However, rather than writing a sentence, we come up with a little shorthand.

To find the value of making 80 phone calls with company A, I could describe that cost as:

A(x) = .10x + 20	**read as the value of A at x is .10x + 20**
A(15) = 10(15) + 20	**read as the value of A at 15 is .10(15) + 20**
A(80) = .10(80) + 20	**read as the value of A at 80 is .10(80) + 20**

Reading & Writing Functional Notation

So to end confusion when working problems, we can substitute different letters for y and develop mathematical notation that doesn't require us to write full sentences when we want to check for different values.

So an equation such as y = 2x + 3 can be written as f(x) = 2x + 3 while an equation y = 5x – 2 could be written as g(x) = 5x – 2. Clearly f and g represent different functions described in x.

We either say g of x = 5x – 2 or g at x = 5x – 2

And to find a particular value of g when x = 10, we use the notation if

g(x) = 5x – 2, then

g(10) = 5(10) – 2

Reading g(x), we say g of x or g at x, meaning the value of g at x.

The value of g when x is 10 is 48. As an ordered pair, we'd write (10, 48)