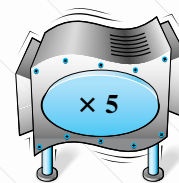


Family Letter

Dear Student and Family Members,

Our next chapter is about functions and their graphs. The concept of functions is central to algebra and has been a major thread throughout this course, although the term *function* has not yet been used.

One useful way to think about a function is as a machine that takes some input (a number or something else) and produces an output. The output must be *unique*, meaning you get only one output for a particular input. Also, the output must be *consistent*: you get that output every time you use the same input. For example, in this machine, if 3 is the input, it goes into the machine and is multiplied by 5, so the output is 15. Every time you input 3 you will get the same answer, 15.



Functions are often expressed as mathematical sentences. For example, each of these rules describes the function represented by the machine above: multiply by 5.

$$y = 5x$$

$$f(x) = 5x$$

$$g(t) = 5t$$

Once we have looked at functions using input-output machines, we will go on to use graphs for finding the maximum and minimum values of functions. We will also use functions to solve problems. For instance, if you have 6 meters of fencing for a rabbit pen and you want the greatest area possible, you can use the function $A(L) = L(3 - L)$ to determine that each side of the pen should have 1.5 meters of fencing.

Vocabulary Along the way, we be learning about these new vocabulary terms:

domain
function

range
x-intercepts

What can you do at home?

During the next few weeks, your student may show interest in functions and their graphs. You might help him or her think of some situations that can be represented as functions, like the following.

Input: the total restaurant bill

Output: the tip at 15%

Input: the side length of a square

Output: the area of that square

Input: number of adult moviegoers

Output: the total cost for tickets at \$8.00 each