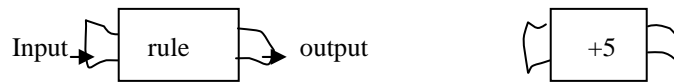


Function Machines

Ok. So far we've dealt with "equations" (one thing is equal to another thing). We will now look at similar and related concept called a "function".

We will start with the idea of a machine that processes something. A function is much like this, so to start thinking about functions, and seeing how things work, let's consider the following "function machine".



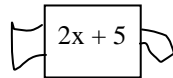
The function machine has three parts, 1.) the input, 2.) the rule, and 3.) the output.

And the way that the function machine works is that you put a number (or set) into the machine, then use the rule upon that number (or set) to produce the outcome which would be another number (or set).

So, let's say we have another function machine, and put a "2" into it. The "2" is the input, the rule says "add 5 to the input" to get the output. $2+5=7$, so the output is "7". If instead, we put in the set $A=\{1,3,5\}$ into the machine, the rule would have we add 5 to each element in the set producing a new set $B=\{6,8,10\}$.

Now, we can assign a symbol to the input, let's use X to represent the variable for input. (We could use another symbol for the variable). We now have more complex rules but the machine works the same.

Ex.



Here we would take the input, multiply it by two and add 5 to it. So if the input was "7", then the output would be $2(7) + 5 = 19$.

Exercise:

- 1.) input = ,rule = , output =
- 2.) input = ,rule = , output =
- 3.) input = ,rule = , output =
- 4.) input = ,rule = , output =
- 5.) input = ,rule = , output =
- 6.) input = ,rule = , output =
- 7.) input = ,rule = , output =
- 8.) input = ,rule = , output =
- 9.) input = ,rule = , output =
- 10.) input = ,rule = , output =