Counting Functions – Part 1

One way to describe a function whose domain is a finite set is to indicate the value of $f(a)$ for each element $a \in A$.

Example A function $f: \{a,b,c\} \to \{1,2\}$ is specified by taking $f(a)=2$, $f(b)=2$, $f(c)=1$. (1)

This function could also be described by writing

$$f: \begin{cases} a \longmapsto 2 \\ b \longmapsto 2 \\ c \longmapsto 1 \end{cases} \qquad (2)$$

Or at times it may be more convenient to use an even more compact shorthand notation expressing f as a string

$$f = 221 \,. \qquad (3)$$

However a description like (3) is non-standard and if you use it then you need to include an explanation with your submitted work. Maybe something like: "If A is a finite set with n elements listed as $a_1, a_2, \ldots, a_n$ then we will identify a function $f: A \to B$ with a string of n elements of B where the i^{th} element in the string equals $f(a_i)$."

The notations used in (1) and (2) are common and don't require special explanation.