Proof. Without loss of generality, let $X = \{1, 2, \ldots, m\}$. In order to define a map $f\colon X \to Y$ we need to make m choices, each time from n possibilities: $f(1)$ can take n different values, so can $f(2)$, and so on up to $f(m)$. Thus there are

$$\underbrace{n \cdots n}_{m} = n^m$$

different maps $X \to Y$. $\square$