

$$f+g : \mathbf{A} + \mathbf{B} \rightarrow \mathbf{P}$$

$$x \mapsto \begin{cases} f(x), & \text{if } x = \iota_{\mathbf{A}}(a), \quad a \in \mathbf{A}, \\ g(x), & \text{if } x = \iota_{\mathbf{B}}(b), \quad b \in \mathbf{B}. \end{cases}$$