

In  $\mathbf{Sets} \times \mathbf{Sets}$ , an arrow is a pair of functions  $f: Y \rightarrow X, f': Y' \rightarrow X'$ . The pair of subsets  $(1 \subset 2, 1 \subset 2)$  is a subobject classifier, and the characteristic arrow of any subobject  $(S \subset X, S' \subset X')$  is evidently just the pair of characteristic functions  $(\phi_S: X \rightarrow 2, \phi_{S'}: X' \rightarrow 2)$  from the category  $\mathbf{Sets}$ . Thus, there are, in  $2 \times 2$ , four “truth-values”. The corresponding subobject classifier for  $\mathbf{Sets}^n$  has  $2^n$  truth-values; as we shall see, it is the Boolean algebra of all  $2^n$  subsets of  $n$ .