

Mathematics 2200H – Mathematical Reasoning

TRENT UNIVERSITY, Fall 2020

Assignment #1011₂

Subsets and Functions

Due on Friday, 4 December.

Recall that the power set of a set A is $\mathcal{P}(A) = \{X \mid X \subseteq A\}$. The somewhat ugly notation ${}^A 2$ denotes the set of functions from A to $2 = \{0, 1\}$, that is

$${}^A 2 = \{f \mid f \text{ is a function } A \rightarrow \{0, 1\}\} .$$

1. Show that $\|{}^A 2\| = \|\mathcal{P}(A)\|$ for any set $A \neq \emptyset$. [10]

Hint: Going back to the definition of cardinality, you need to find a suitable correspondence between functions $f : A \rightarrow \{0, 1\}$ and subsets $X \subseteq A$.