

Problem Set

Sheet *0* — CS130

1. List all the subsets of the following set $\{1, 2, \phi\}$
 $\{1\}, \{2\}, \{\phi\}, \{1, 2\}, \{1, \phi\}, \{2, \phi\}, \{1, 2, \phi\}, \phi$
2. How many elements are there in the domain of a function $h : \{0, 1\}^3 \rightarrow \{0, 1\}$?
Give an example of such a function
- 8, $h(x, y, z) = x \bullet y \bullet z$
3. What are the following Sets commonly called
 - (1) $\{n \in \mathbb{Z} \mid n = 2m \text{ for some } m \in \mathbb{Z}\}$: Set of even numbers
 - (2) $\{k \in \mathbb{N} \mid \text{there exist } p, q \in \mathbb{N} \text{ such that } k = pq \text{ and that } 1 < p < k \text{ and } 1 < q < k\}$: Set of Non Prime Numbers [Composite Numbers](#)
 - (3) $\{x \in \mathbb{R} \mid \text{there exist } a, b \in \mathbb{Z} \text{ such that } b \neq 0 \text{ and } x = a/b\}$: Set of Rational Numbers
4. $\{n \in \mathbb{Z} \mid n = m^3 \text{ for some } m \in \mathbb{Z} \text{ such that } -4 \leq m \leq 4\}$

For 3.2, 0 and 1 are not part of the set so the set cannot be all the non prime numbers as 0 and 1 would be in this set