\[ J = \{1, 2, 3, 4, \ldots \} \quad W = \{0, 1, 2, 3, 4, \ldots \} \]

\[ J_n = \{1, 2, 3, \ldots, n\} \quad n(S) = m \text{ means } S \approx J_m \]

Suppose \( a, b \) are whole numbers. Let \( A \) and \( B \) be sets such that \( n(A) = a \), \( n(B) = b \) and \( A \cap B = \emptyset \).

The addition and multiplication operations are defined as follows:

\[ a + b = n(A \cup B) \quad \text{and} \quad a \cdot b = n(A \times B) \, . \]

Given any whole numbers \( a, b, \) and \( c, \)

1. \( a + b = b + a \)
2. \( a + (b + c) = (a + b) + c \)
3. \( a + 0 = a \)
4. \( a \cdot b = b \cdot a \)
5. \( a \cdot (b \cdot c) = (a \cdot b) \cdot c \)
6. \( a \cdot 1 = a \)
7. \( a \cdot (b + c) = a \cdot b + a \cdot c \)