**🎓 Gauss's Sum Formula**Gauss's method is designed to **quickly and efficiently calculate the sum of a sequence of consecutive numbers**, especially from **1 to n**, **without having to add each number one by one**.

**🔷 Problem:**  
Find the sum of all whole numbers from 1 to **n**.

**✅ Formula:**  
Sum = n(n + 1) ÷ 2

**🔷 Example:**  
Find the sum from 1 to 300:

Sum = 300 × (300 + 1) ÷ 2  
Sum = 300 × 301 ÷ 2  
Sum = 45,150

**📝 Why it works (in plain language):**

* Pair numbers from opposite ends: (1 + n), (2 + n−1), (3 + n−2), etc.
* Each pair adds to the same total.
* There are n ÷ 2 such pairs (if n is even).

**🧩 Tips to Remember:**

* "n(n + 1) ÷ 2" is your shortcut.
* Works for any sequence starting at 1.
* To sum numbers from **a to b**, use:  
  Sum = [b(b + 1) ÷ 2] − [(a − 1)a ÷ 2]

**Set Formulas**

1. **Union of Two Sets:**  
   n(A ∪ B) = n(A) + n(B) − n(A ∩ B)
2. **Union of Disjoint Sets:**  
   If A ∩ B = ∅, then  
   n(A ∪ B) = n(A) + n(B)
3. **Union of Three Sets (Inclusion-Exclusion Principle):**  
   n(A ∪ B ∪ C) = n(A) + n(B) + n(C) − n(A ∩ B) − n(B ∩ C) − n(A ∩ C) + n(A ∩ B ∩ C)
4. **Intersection of Two Sets (using union):**  
   n(A ∩ B) = n(A) + n(B) − n(A ∪ B)
5. **Union in terms of set differences:**  
   n(A ∪ B) = n(A − B) + n(B − A) + n(A ∩ B)

**The number of subsets of a set with nelements is 2n.**

For any set A, the empty set (∅) is one of its subsets.  
So, when counting the number of subsets, always include the empty set.

**Example:**  
If A = {w, y}, its subsets are:

* ∅
* {w}
* {y}
* {w, y}

That makes a total of 4 subsets, including the empty set.