

Induction

2/21

①

For all natural number n ,

$$1 + \dots + n = \frac{n(n+1)}{2}$$

Intuition

Blue eye problem.

You know that in a group of n students, there are n students with blue eyes. When will those n students leave the island?

Case 1: there is only one student with blue eyes.
The student with blue eyes will not see any other students with blue eyes \rightarrow he will know he has blue eyes. He can leave on day 1.

Case 2: There are 2 ^{students} ~~people~~ with blue eyes. (2)

The first day, no one can leave.

The two students with blue eyes will leave on the second day.

Case 3: There are 3 students with blue eyes.

$R(N)$: N students with blue eyes will leave on the N -th day.