LS - 20/08/2024

Ancient India

Decimal System of Numeration & the Concept of Zero

Text - 'History of Ancient Indian Math' by Srinivasa Iyengar

1. The most fundamental contribution of Ancient India to Math.

2. Use of 9 digits and a symbol '0' (called zero) to represent a no.

3. Each digit in this representation has a place value and a face value

The no. being represented can be recovered by summing up the

place values of all the digits in its representation

$$S_n \ldots S_0 = \sum_{k=1}^{n} S_k \cdot 10^k$$

eg - $9807 = 9\times10^3 + 8\times10^2 + 0\times10^1 + 7\times10^0$

4. ∵ this is taught at such a young age that we lose sight of its profoundity & importance.

5. Civilizations who used unary system made slower progress

eg - Greeks

- **Controversy** - Who should be given credit for devp. of decimal system

- Arabs OR Indians ?

- **Current consensus** -

Indians introduced decimal system.
Arabs assimilated it & conveyed it to Europe & Africa

- **Quotes from ancients texts**
  - Vedas
  - Ramayana
  - Harappa & Mohenjodaro (~3000 BCE)
  - Jain texts (500 BCE - 100 BCE)
  - Buddhist texts

1. Veda (Yajur) - Ek, Das, Shat, Sahastra, Ayut, Niyut, Prayut, Arbud, etc.
(Powers of Ten)