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The only civilization which taught Mathematics in the form of Shlokas ■■■

Lilavati (Story) #Thread

'Lilavati' is a 'Treatise' of the great Indian Mathematician Bhaskaracharya which was written in 1150. It is the first volume of his main work, the "Siddhanta Shiromani".

A simple problem taken from the twelfth-century Indian mathematician Bhaskara's *Lilavati* ('Arithmetic')

अथ विश्लेषजास्युदाहरणम्—
पञ्चाशोऽङ्किङ्कुष्ठात्कद्बयपगमरत्र्यंशः त्रिछोंऽ्धं त्रयो·
विश्लेषत्रिगुणो मृगाक्षि कुटजं दोलायमानोऽपरः ।
कान्ते केतकमालतीपरिमलप्राप्तेक्फालमिया-
दूहाहृत इतस्ततो भ्रमति खे भृङ्गोऽलिसंख्यां वद ॥

Example of the reduction of fractions
to a common denominator:

One-fifth of a swarm of bees flew towards a lotus flower, one-third towards a banana tree. (A number equal to) three times the difference between the two (preceding figures), O my beauty with the eyes of a gazelle, flew towards a Codaga tree (whose bitter bark provides a substitute for quinine). Finally, one other bee, undecided, flew hither and thither equally attracted by the delicious perfume of the jasmine and the pandanus. Tell me, O charming one, how many bees were there?

Let x = the number of bees

$$x = \frac{x}{5} + \frac{x}{3} + 3 \times \left(\frac{1}{3} - \frac{1}{5}\right) + 1$$

Reducing the fractions to a common denominator, we get:

$$x = \frac{3x}{15} + \frac{5x}{15} + 3 \times \frac{(5-3)}{15} \cdot \frac{1}{15} + 1$$

$$x = 15$$

(■■A problem from the 'Lilavati' by Bhaskaracharya. This appeared in the "Mathematical Mystery Tour" by UNESCO in 1989)

It was named after his daughter Lilavati. She was a very beautiful child and very intelligent too, which was a rare combination.

Bhaskara was apprehensive about his daughter's inquisitiveness and curiosity. The little girl asked her father many questions and gained a lot of knowledge this way.

As she grew up, Bhaskara decided to get Lilavati married. In the process, Bhaskara perused Lilavati's horoscope.

He was shocked when he found out that Lilavati would not have a happy married life if she did not get married at a particular auspicious time.

He did not tell Lilavati about this, as he despised hurting his daughter.He made all arrangements to make sure that

Lilavati would get married at the auspicious time.

In order to make sure that he did not miss this particular time, he kept a cup with a small hole at the bottom of a vessel filled with water, arranged so that the cup would sink at the beginning of the destined auspicious hour.

He forewarned Lilavati not to go near the vessel.

When Bhaskara was not around, Lilavati, could not hold her curiosity and went to see what her father had devised.

When Lilavati went close to the device, she bent forward to get a closer look. A little pearl from

her nose ring fell into the water. She rushed back in a hurry so that her father would not find out what she was up to.

The little pearl that fell into the water upset the calculations made by Bhaskara and the wedding took place, but not at the auspicious hour.

As destined, Lilavati's husband died a few days after the marriage.

Bhaskara brought back his widowed daughter to his residence. Lilavati's face had lost its initial charm. She seemed disinterested in the normal day to day activities. She sat by the pond looking into

nothingness and wept. She remained silent most of the time. Bhaskara found it very difficult to see these changes in his beautiful daughter.

He thought of a way to get her out of her depressed state. He posed 'Arithmetic Problems' at Lilavati about the things around

her and asked her to find solutions to the problems.

Lilavati, the brilliant girl that she was, solved all the problems posed to her. Lilavati's mind which was busy in solving the mathematical problems posed by her father, never again got depressed.

It is believed that the problems posed to 'Lilavati' form the major portion of 'Bhaskara's Treatise' which is named after her.

Lilavati was given and could solve complex problems which are now resolved using the Pythogoras theorem.

Thus Lilavati became one of the 1st eminent women Mathematicians of India.

It is believed that Bhaskara was also interested in poetry, therefore most of the problems in 'Lilavati', his Mathematical Treatise, are Poetic.

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