



Pythagorean Geometry in Vedic-Era

For Prelims: Indian Ancient History, Vedic Age, Veda System

For Mains: Significance of Veda System, Significance of Vedic Age

Why in News?

Recently, a position paper by the Karnataka government on the [National Education Policy \(NEP\) 2020](#) has described **Pythagoras's theorem as "fake news"**.

- It has referred to a text called the **Baudhayana Sulbasutra**, in which a specific shloka refers to the theorem.

What do we need to know about Pythagoras?

- **About Pythagoras:**
 - Evidence suggests that the **Greek philosopher (around 570-490 BC) did exist.**
 - There is an element of mystery around him, largely because of the **secretive nature of the school/society he founded in Italy.**
 - Relatively little is known about his mathematical achievements, because there is **nothing today of his own writings.**
- **About Pythagoras Theorem:**
 - The Pythagoras theorem describes the **relationship connecting the three sides of a right triangle** (one in which one of the angles is 90°).
 - $a^2 + b^2 = c^2$
 - If any two sides of a right triangle are known, the theorem allows you to calculate the third side.

How do we know that Vedic Indian Mathematicians knew this?

- There are references of Pythagoras in the **Sulbasutras**, which are texts pertaining to **fire rituals (yajanas) performed by Vedic Indians.**
 - The oldest of these is the **Baudhayana Sulbasutra.**
- The period of Baudhayana Sulbasutra is uncertain. It is estimated based on **linguistic and other secondary historical considerations.**
 - In recent literature, **Baudhayana Sulbasutra is taken to be from around 800 BCE.**
- Baudhayana Sulbasutra contains a **statement of what is called Pythagoras theorem** (it was known rather as a geometric fact, and not as a 'theorem').
- The yajna rituals involved construction of **altars (vedi) and fireplaces (agni)** in a variety of shapes such as **isosceles triangles, symmetric trapezia, and rectangles.**
 - The sulbasutras describe **steps towards construction** of these figures with prescribed sizes.

How did the Knowledge of Equation Evolve?

- The earliest evidence is from the **Old Babylonian civilisation** (1900-1600 BCE).
 - They referred to it as the **Diagonal Rule**.
- The earliest evidence of a proof comes from a **period after the sulbasutras**.
- The oldest surviving axiomatic proof of the theorem is in the **Elements of Euclid** from around 300 BCE.

What are Vedas?

- The word **Veda** signifies **knowledge** and the texts are actually about providing **mankind knowledge to conduct their entire life on earth and beyond**.
- There are four major vedas:
 - **Rig Veda:**
 - **Oldest** existing veda among the four.
 - Focus is on **worldly prosperity and natural beauty**.
 - Text is organised in 10 books known as **Mandalas**.
 - Prominent gods mentioned in Rig Veda:
 - **Lord Indra, Agni, Varuna, Rudra, Aditya** etc.
 - **Yajur Veda:**
 - The name Yaju signifies **Sacrifice**.
 - It concentrates on **rites** and **mantras** of the different types of sacrifices.
 - Two major recensions (samhita) are:
 - **Shukla**, also called **Vajasaneyi Samhita**.
 - **Krishna**, also called **Taittiriya Samhita**.
 - **Sama Veda:**
 - It has been named after **Saman** (melody).
 - It concentrates on **Melody** or **Songs**.
 - It is also called the **Book of Chants**.
 - **Atharva Veda:**
 - It is also known as **Brahma Veda** and has been attributed to two rishis called **Atharban** and **Angiras**.
 - It concentrates on **Peace** and **Prosperity** of human society.
 - Two major recensions (sakhas) are:
 - **Paippalada**
 - **Saunakiya**

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