

L13 - 24/09/2024



Modern perspective on Brick Problems

Let us consider the problem that came up

$$\frac{x}{m^2} + \frac{(21-x)}{n^2} = 1$$

$$\Rightarrow n^2x + m^2(21-x) = m^2n^2$$

$$\Rightarrow \underbrace{m^2n^2 - n^2x + m^2x - 21m^2}_{\Delta(m,n,x)} = 0$$

$$\Delta(m,n,x) = 0$$

Polynomial
in 3 variables



We are interested in the integral roots of $\Delta(m,n,x)$

$$V_{\mathbb{Z}}(\Delta(m,n,x)) = \{ (m,n,x) \in \mathbb{Z}^3 : \Delta(m,n,x) = 0 \}$$

Hypersurface

Similarly, $V_{\mathbb{Q}}, V_{\mathbb{R}}, V_{\mathbb{C}}$ can be studied using tools from algebraic geometry - for \mathbb{R} & \mathbb{C} (arithmetic) - for \mathbb{Z} & \mathbb{Q}

Conclusion

They had also studied approximations of irrationals (infinite series)

Results here interact with the first two and the sixth vol. of Euclid's elements.

Difference - Euclid's work was evidently based on the principles of logic.

This is not discernable here i.e.

there is no direct account of their methods.

However, Prof. Iyengar remarks that given the complexity of their methods, they must be credited with some logic in their methods.

Also, Rishis were practising yogis. So, their subtle perception can allow 'seeing truth' directly.

Remember, sulva sutras were just adjunct texts.

This offers a fresh perspective on the topics we learn in modern times & motivated by universal well-being.