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Derivation of Trigonometric Identities and Solutions through Baudhayan Numbers

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Abstract : Students often face significant challenges in understanding and applying trigonometric identities, primarily due to the overwhelming need to memorize numerous formulas. This often leads to confusion, frustration, and difficulty in effectively using these formulas across diverse types of problems. Traditional methods of learning trigonometry demand considerable time and effort, which can further hinder comprehension and application. Vedic Mathematics offers an innovative and simplified approach to overcoming these challenges. This paper explores how Baudhayan Numbers, can be used to derive trigonometric identities and simplify calculations related to height and distance. Unlike conventional approaches, this method minimizes the need for extensive paper-based calculations, promoting a conceptual understanding. Using Vedic Mathematics Sutras such as Anurupyena and Vilokanam, this approach enables the derivation of over 100 trigonometric identities through a single, unified approach. The simplicity and efficiency of this technique not only make learning trigonometry more accessible but also foster computational thinking. Beyond academics, the practical applications of this method extend to engineering fields such as bridge design and construction, where precise trigonometric calculations are critical. This exploration underscores the potential of Vedic Mathematics to revolutionize the learning and application of trigonometry by offering a streamlined, intuitive, and versatile framework.

Keywords : baudhayan numbers, anurupyena, vilokanam, sutras
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