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TRIGONOMETRY

"The deep study of nature is the most fruitful source of mathematical discoveries"
- Joseph Fourier.

French mathematician **Francois Viete** used trigonometry in the study of Algebra for solving certain equations by making suitable trigonometric substitutions. His famous formula for π can be derived with repeated use of trigonometric ratios. One of his famous works titled Canon Mathematics covers trigonometry; it contains trigonometric tables, it also gives the mathematics behind the construction of the tables, and it details how to solve both plane and spherical triangles. He also provided the means for extracting roots and solutions of equations of degree atmost six. Viete introduced the term "coefficient" in mathematics. He provided a simple formula relating the roots of a equation with its coefficients. He also provided geometric methods to solve doubling the cube and trisecting the angle problems. He was also involved in deciphering codes.



Francois Viete
(1540–1603 AD(CE))



Learning Outcomes

- To recall trigonometric ratios.
- To recall fundamental relations between the trigonometric ratios of an angle.
- To recall trigonometric ratios of complementary angles.
- To understand trigonometric identities.
- To know methods of solving problems concerning heights and distances of various objects.



6.1 Introduction

From very ancient times surveyors, navigators and astronomers have made use of triangles to determine distances that could not be measured directly. This gave birth to the branch of mathematics what we call today as "**Trigonometry**".

Hipparchus of Rhodes around 200 BC(BCE), constructed a table of chord lengths for a circle of circumference $360 \times 60 = 21600$ units which corresponds to one unit of circumference for each minute of arc. For this achievement, Hipparchus is considered as "**The Father of Trigonometry**" since it became the basis for further development.