Trigonometric Functions -- Some History

Trigonometry began in the work of Greek astronomers, especially Aristarchus of Samos, and was developed further by the Greek mathematical astronomers Claudius Ptolemy and Menelaus, in Alexandria, Egypt in the first few centuries of the Common Era. For these scholars, there was one major function, the length of the chord of a circle as a function of the length of the circular arc joining its endpoints.

It was Indian astronomers (500-900 C.E.) who decided to study what we now call the sine and cosine as functions of an angle in a right triangle. After this knowledge was brought to the Arab and Persian world in medieval times and developed further, it was transmitted to Europe through contacts among merchants and as a result of warfare. The word “sinus” arose from a misinterpretation of the Arabic word for this concept.

Thomas Flinck of Flensburg, Germany, introduced the names “tangent” and “secant” into trigonometry in his book of 1583. Between 1624 and 1636, Edmund Gunter invented “cosine” and “cotangent,” with the prefix “co-” meaning “complement.” (In a right triangle, the cosine of an acute angle is the sine of its complementary angle.)

Inverse trigonometric functions were considered early in the 1700s by Daniel Bernoulli, who used “A.sin” for the inverse sine of a number, and in 1736, Euler wrote “A t” for the inverse tangent. As early as 1772, J.L. Lagrange used the symbols “arcsin” and “arctan.” These writers were identifying an angle with the arc it subtends when placed at the center of a circle. John Herschel introduced the sin⁻¹ and tan⁻¹ notations in an article in the Philosophical Transactions of London in 1813.