

Luca Pacioli

Modern accounting is attributed to Italian mathematician and

Franciscan monk Friar **Luca Pacioli** (1445 – 1517). He is credited with the first publication of the “Venetian method” of keeping accounts, now known as “double-entry bookkeeping.”

Little is known of his life except he was born in Sansepolcro, and it is believed that as a boy Pacioli came under the influence



of the artist Piero della Francesca from whose work he freely borrowed. At about the age of twenty Pacioli went to Venice to become a tutor to the sons of a wealthy merchant. In 1471 he arrived in Rome and entered the brotherhood of St. Francis. Pacioli traveled extensively, wandering through Italy and possibly to the Orient and lectured on mathematics at Perugia, Rome, Naples, Pisa, and Venice. He was at the court of Ludovico Sforza, known as the Moor, at Milan with Leonardo da Vinci. It was here, at the most glittering court in Europe, that Pacioli became the first occupant of the chair of mathematics. Pacioli spent the last years of his life in Florence and Venice, returning to the place of his birth to die.

Pacioli’s chief work *Summa de arithmetica, geometria, proportioni e proportionalita* (*Everything about Arithmetic, Geometry, and Proportions*) was published in 1494. It was written as a digest and guide to existing mathematical knowledge. That his book was printed, only twenty-five years after Gutenberg had invented the printing press, attests its significance. In this work, Pacioli drew freely upon the writings of Leonardo of Pisa for the theory of numbers. In doing so he preserved some of the lost works of the latter. The *Summa*, written in the vernacular, is divided into two parts. The first deals with arithmetic and algebra, the second with geometry. In the arithmetic he gave rules for the fundamental operations and a method for finding square roots. He also dealt with mercantile arithmetic, discussing bills of exchange and the theory of bookkeeping. In the algebra he considered linear and quadratic

equations and problems leading to these equations. In the geometric sections, Pacioli applied algebra to investigate properties of figures.

The *Summa* and a few others of his books formed the basis of the works of the sixteenth century mathematicians, including Cardano and Tartaglia. Pacioli was something of a careless writer, so much so that Cardano devoted a chapter in his book *Arithmetica* (1539) to dealing with Pacioli's errors. Pacioli's 1509 publication *Divina proportione* discussed the "Divine Proportion" or "golden ratio," [that is, the division of a line segment AB by an interior point P , so that $AB/AP = AP/PB$] and the theorems of Euclid relating to it. Leonardo da Vinci drew the figures for the text that also included results on regular and semiregular polyhedra. Pacioli also published a Latin translation of Euclid's *Elements* based on the 13th century translation of Giovanni Campanus. At his death Pacioli left an unpublished major work *De viribus amanuensis* on recreational mathematics, geometry problems and proverbs. There is little originality in Pacioli's work. He never tried to pass off what he wrote as his own and always gave credit to the sources he used. He described himself as a "humble professor of sacred theology."

Pacioli dedicated 36 short chapters of his *Summa* to bookkeeping, which he entitled *De Computis et Scripturis (Of Reckoning and Writings)*. The Friar did not invent accounting. He merely distilled the practices employed by merchants of Venice at the time. His topics were very much as found in accounting today. Pacioli described keeping journals and ledgers. His ledger included assets (including receivables and inventories), liabilities, capital, income and expense accounts. He demonstrated year-end closing entries and proposed that a trial balance be used to prove a balanced ledger and even had something to say about accounting ethics and cost accounting. As a good bookkeeping instructor should, he warned that no clerk should retire at night before reconciling the debits and the credits, so that they are equal.

Quotation of the Day: [The *Summa*'s chapters on bookkeeping were added] “in order that the subjects of the most gracious Duke of Urbino may have complete instructions in the conduct of business, [and to] give the trader without delay information as to his assets and liabilities.” – Luca Pacioli