Renaissance Names (15th Century)

The Italian abacists of the 14th century were instrumental in teaching the merchants the "new" Hindu-Arabic decimal place-value system and the algorithms for using it. There was formidable resistance to this system, in Italy and most of Europe, but it saved time and money... and could be audited!

1344 AD: Dardi of Pisa Wrote the book *Aliabraa argibra* extending the usual Islamic list of 6 equations to 198 equations.

$$(x+b)^3 = c \qquad x^3 + 3bx^2 + 3b^2x = c - b^3 \qquad x = \sqrt[3]{c} - b$$

For example, $x^3 + 60x^2 + 1200x = 4000$ has $b = 20$, $c = 12,000$ yields $x = \sqrt[3]{12000} - 20$. Clearly this method does not generalize!

Example: A man lent 100 lire to another at an interest rate of x denarii per month, compounded annually. After 3 years he gets back 150 lire. What was the interest rate? (240 denarii=1 lira, so the annual interest rate is $12x$ denarii/lire, or $x/20$ lire/lire.) $100(1 + x/20)^3 = 150$

1430–40 AD: Piero della Francesca Wrote *Trattato d'abaco*, extending Dardi's rules to polynomials of degree 5 and 6.

1440 Johannes Gutenberg invented the printing press. Not math but...

1435 AD: Leon Battista Alberti Wrote *Della pintura* on geometry and perspective, invented the Vigenère cipher (see Math 348).

1463 Regiomontus (Johannes Müller) Wrote *On triangles of every kind*. The translation of his name into German is Königsberg (today Kaliningrad).

1484 AD Nicolas Chuquet French physician in Lyon, wrote *Triparty* Introduced exponential notation: a^2 meant ax^2, a^{m2} meant ax^{-1}. Unfortunately, *Triparty* was never printed and it became ignored after Paciolo's printed books.

1494 AD: Luca Paciolo (Franciscan friar in Sansepolcro Italy) Wrote *Summa de arithmetica, geometrica, proportioni et proportionalota*. In 1509 he wrote a Latin translation of Euclid's *Elements*, and one of the first math texts to be printed.

1524 AD: Christoff Rudolff Wrote *Coss* which first used $\sqrt{}$, $+$ and $-$ signs.

1544 AD: Michael Stifel Itinerant Lutheran preacher, professor at Jena. Wrote *Arithmetica integra*, which combined all quadratic equations to $x^2 = bx + c$. Allowed negative coefficients, but did not accept negative numbers as solutions.

1557 AD Robert Recorde Wrote *The Whetstone of Witte*, first English algebra book. Introduced modern equal sign "bicause noe 2 thynges can be moare equalle" He was also the physician to King Edward VI and died in prison.

Nicole Oresme

1323-1382

Master at Univ. of Paris 1349, Dean of Rouen Cathedral 1361-1377, then Bishop of Lisieux

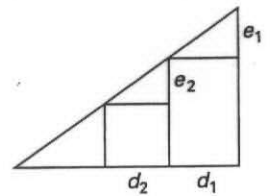*Treatise on the Configuration of Qualities and Motions* (1350)

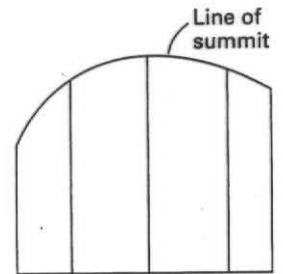"Every measurable thing (except numbers) is imagined in the manner of continuous quantity."

Drew the first graphs: "Every intensity which can be acquired succesively (function) ought to be imagined by a straight l line perpedicularly erected on some point (bar graph)"

*C*onfiguration is just the region under the curve.

Representing velocity as a curve, time is x-axis; distance travelled is the area under the curve

Uniformly difform velocity

Difformly difform velocity, or nonuniform acceleration

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Treatise on the Configuration of Qualities and Motions (1350)

Regiomontanus (1436-1476)
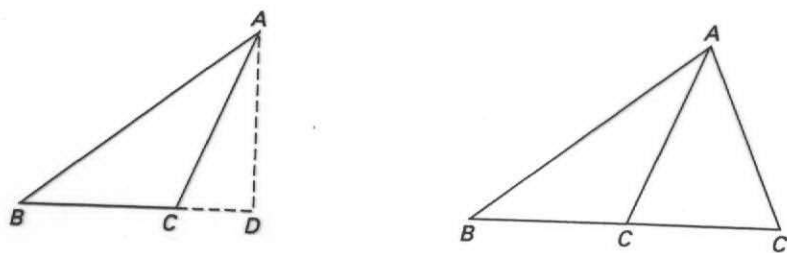## Johannes Müller von Königsberg

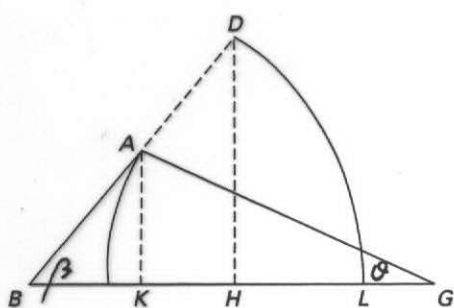FIGURE 9.4 *On Triangles:* The ambigious case

FIGURE 9.5 Proof of the law of sines

$$\frac{AB}{AG} = \frac{\sin(\theta)}{\sin(\beta)}$$

After graduating in 1457 (Vienna), he lectured on optics and was supported by Basilios Bessarion. In 1461, he moved to Rome with the Cardinal in 1461 as part of his house-hold. In 1465 he built astrolabes for. Cardinal Bessarion. In 1467 Regiomontanus left Rome to work at the royal court of Hungary (Matthias Corvinus). In 1471 he moved to the free city of Nuremberg, where he built the first astronomical observatory in Germany

In 1475 he went to Rome to work with Pope Sixtus IV, and died suddenly (reportedly by assasination) in 1476 at the age of forty.

He wrote *De Triangulis omnimodus* (1464) and *Epytoma in almagesti Ptolemei.*

De Triangulis (On Triangles) was one of the first textbooks presenting the current state of trigonometry and included lists of questions for review of individual chapters.

Cardano noted that much of the material on spherical trigonometry was plagiarised by Regiomontanus from the 12th-century work of the Islamic Jabir ibn Aflah.