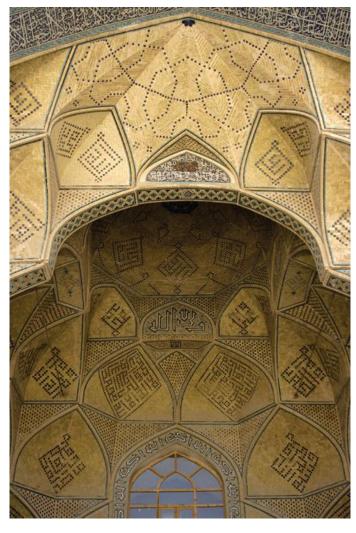# TCI 9.7 Mathematics

Muslims greatly advanced the study of mathematics. They based their work in part on ideas from ancient Babylon, India, and Greece .For example, scholars in Baghdad's House of Wisdom translated the works of the Greek mathematician Euclid (YOO-klid), as well as important texts from India. Then they adapted what they learned and added their own contributions.

One of these Muslim scholars was the astronomer and mathematician al-Khwarizmi (ahl KWAR-iz-mee), who worked in the House of Wisdom in Baghdad in the 9th century. Al-Khwarizmi is best known as "the father of *algebra*." In fact, the word algebra comes from the title of one of his books. It originated in an Arabic phrase, *al-jabr*, meaning "the reunion of broken parts."

Algebra is used to solve problems involving unknown numbers. An example is the equation $7x + 4 = 25$. Using algebra, we can figure out that in this equation, x represents 3. Al-Khwarizmi's famous book on algebra was translated into Latin in the 12th century and became one of the most important mathematics textbooks used in the universities of Europe.

The translation of another one of al-Khwarizmi's books helped to popularize Arabic numerals in Europe. Actually, Muslims learned this way of writing numerals, along with fractions and decimals, from Indian scholars. Arabic numerals were a big help to business and trade since, compared to earlier systems like Roman numerals, they made it easier for people to do calculations and check their work. We still use Arabic numerals today.

Muslims also spread the Indian concept of zero. In fact, the word *zero* comes from an Arabic word meaning "something empty." Ancient peoples used written symbols for numbers long before anyone thought of using a symbol for zero. However, zero is very important in calculations. (Try subtracting 2 from 2. Without using zero, how would you express the answer?) Zero also made it easier to write large numbers. For example, zero allows people to distinguish between 123 and 1,230.