

Sutayta Al Mahamali

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Learning Objectives:

1. SWBAT learn that when Sutayta solved quadratic equations in 10th century Baghdad, Europe groaned in obscurity.
2. SWBAT understands how she overcame all the odds and became the first Muslim woman mathematician.
3. SWBAT discovered that women are biologically as capable as men when it comes to mathematics.



Sutayta Al Mahamali was born in 930 AD and raised in a city that was the center of mathematics development during the 10th century. It was not Athens or London. New York was nonexistent back then. It was Baghdad, a city which was built near Babylon where mathematics emerged in the 3rd millennium BC during the Bronze Age on clay tablets scripted in Sumerian languages. Baghdad became an influential city after the Abbasids made it the capital for its Caliphate in 762.

By 800 AD, Baghdad became the center of science and mathematics in the world where many researchers worked in the House of Wisdom including al-Khwarizmi, the father of Algebra, to translate Greek mathematical and scientific books into Arabic. Al-Khwarizmi's textbook was revolutionary, due to disregarding Babylonian base 60 (sexagesimal) and Greek Geometry centric mathematics, as was the convention at that time, instead he used base 10, which is now known as Hindu-Arabic numerals and algebra. Sutayta grew up in this environment where discovery was booming – known as the Islamic Golden Age.

Sutayta's father Abu Abdallah al-Hussein was a judge who published a few books on Islamic jurisprudence, and he wanted to make his daughter an Islamic scholar. Education was important to Abdallah al-Hussein and Sutayta religious education began with him at home. By 935 AD, it was

obvious Sutayta was talented in mathematics and her father chose to focus on both instead of only religious education. At age of 10, Sutayta started helping people from her community with mathematics, especially inheritance mathematics.

In 845 AD, her father gave her a copy of *The Compendious Book on Calculation by Completion and Balancing* (authored by Al-Khwarizmi), and Sutayta quickly discovered that almost half of the book deals with inheritance mathematics. She was not only solving problems from Al Khwarizmi's book, but also creating general solutions to types of problems, which would be a logical extension of *The Compendious Book on Calculation by Completion and Balancing* (Dale DeBakcsy). “She was called a genius by not one but three historians of Islamic Golden Age —Ibn al-Khatib Baghdadi, Ibn al-Jawzi, and Ibn Kathir.” (Mehmedović, 2020).

As a young woman she often pondered the math of inheritance, cubic equations and algebraic theories. “Today, in the West, she would be called a "renaissance woman", but the renaissance in Europe did not appear until four centuries later.” (Mehmedović, 2020) Her expertise in mathematics was known to people who worked at the House of Wisdom. She poured all her time and energy into mathematics, especially inheritance mathematics.

She collaborated with Abu Kamil to solve cubic type equations that gripped the imaginations of their successors Ibn al-Haytham and Omar Khayyam.

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