

**Fatma Moalla**  
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Learning Objectives:

1. SWBAT learn about Fatma Moalla, the first Muslim Woman with Ph.D in mathematics.
2. SWBAT explain why did first Muslim woman with Ph.D emerged in Africa rather than Middle East, where Islam was born.
3. Minority students will be motivated upon finding someone who looks like them in the STEM field, while other students will benefit from a more inclusive mindset of who can be a mathematician.



Is it surprising that First Muslim woman who earned Ph.D in mathematics was born in the same country where the founder of world's first University was also born. Their birth is 1139 years apart. Fatima al-Fihri and Fatma Moalla were born in the same country, Tunisia, former in 800 AD and later in 1939. Although, they born more than one millenia aprart, nevertheless Moalla is a validation of the behind Fihri. Moalla earned Ph.D in mathematics in 1965--more than millennia after Fihri founded Al Karawan University.

How hard is it to earn a Phd in math? Look no further than Fazilatunnesa who was the first Muslim woman student at Bethune College and later she became the first Muslim woman at University of Dhaka where she earned master's degree in mathematics with gold medal and distinction as first class first. In 1928, she became the first Muslim woman who received a scholarship from the Indian Government to pursue Ph.D in mathematics in Europe.

Fazilatunnesa was very close to completing her Ph.D in mathematics from Europe. However, she had to return to East Bengal to be with her dying father and never went back to Europe to depend on her dissertation. The world of Muslim women had to wait 28 more years to see their first recipient of mathematics doctorate. Her name is Fatma Moalla. She earned her Ph.D in

Mathematics in 1965 from Europe. It should be noted, the first man who earned Ph.D in mathematics was Erhard Weigel from University of Leipzig in 1650 and Sofya Kovalevskaya was the first female who earned Ph.D in Mathematics in 1874. Notice the timeline: 1650, 1874 and 1965.

Fatma Moalla was born in 1939 in Sfax, a city which is about 84 miles from Kairouan, a city where Fatima Al Fihri was born in 800 AD. Like her predecessor, Fatma's father, Mohamed Moalla, migrated from Sfax to Tunis, the Capital of Tunisia, where he started business as a bookseller. Muhammad Moalla had six daughters and five of them were born in Tunis. Fatma's greatest childhood joy was reading books with her five siblings in her father's bookstore during the nonbusiness hours. "From my childhood, I will also remember that our greatest joy, my sisters and myself, was to go into my father's bookstore to practice our favorite sport: reading"

When she played sports with her siblings, she never used any dishonesty or cheating to win the game. If she lost the game, she would accept the defeat without any argument. She claims that these types of characteristics led her to become a mathematician. "With hindsight, I believe that the reason is that mathematics corresponded more to my character: I adore rigor, precision and honesty. I hate cheating. And this is mathematics".

Fatma fell in love with mathematics upon moving from Rue du Pacha High School to Lycée Carnot de Tunis from where she earned her bachelor degree in mathematics in 1957. As a student of mathematics, she discovered a parallel between her characteristics and mathematics. She went on to study advanced mathematics at Université Tunisie and in 1965 she received Ph.D in Mathematics. Moalla worked as mathematics teacher at Lycée de la Rue du Pacha for two years. After earning Phd in mathematics, she joined the University of Tunis as a mathematics professor.

She worked there until her retirement. Moalla published many papers on various topics including Riemannian manifold (1964) in which she show that either every geodesic can be continued indefinitely in either direction or else it is closed; total scalar curvature to a compact manifold (1965) in which she proves Finsler structure and global Riemannian geometry (1966) in which she show Finsler space is defined as a structure on the bundle of all non-zero tangent vectors.

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