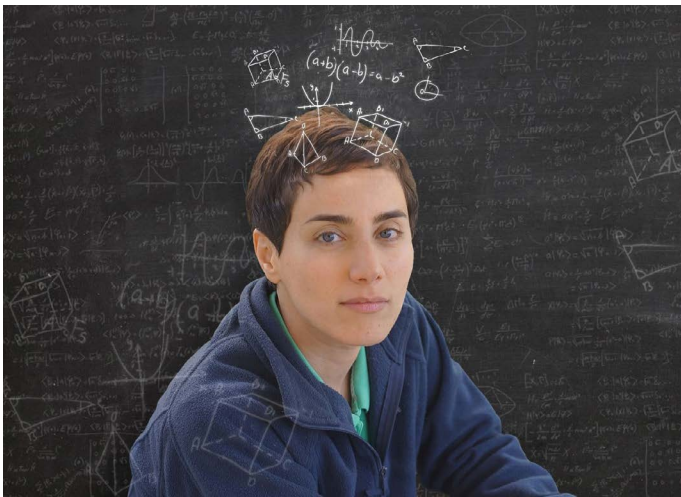


# 7-9: REMOTE MATHS

EDITION 6

## CELEBRATING WOMEN IN MATHEMATICS



At the 2018 World Meeting for Women in Mathematics, held in Rio de Janeiro, Brazil, it was decided to designate Maryam Mirzakhani's birthday (May 12) as a day for celebrating women in mathematics.

'May 12th is a joyful opportunity for the mathematical community to celebrate women in mathematics. The celebration takes place every year, all around the world. The goal of the day is to inspire women everywhere to celebrate their achievements in mathematics, and to encourage an open, welcoming and inclusive work environment for everybody.'

Maryam Mirzakhani was the first woman and first Iranian to win the prestigious Fields Medal. 'Mirzakhani specialized in theoretical mathematics that read like a foreign language by those outside of mathematics: moduli spaces, Teichmüller theory, hyperbolic geometry, Ergodic theory and symplectic geometry,' according to a news release from Stanford University, where Mirzakhani was a mathematics professor until her death.

'Her work was highly theoretical in nature, but it could have impacts concerning the theoretical physics of how the universe came to exist and, because it could inform quantum field theory, secondary applications to engineering and material science. Within mathematics, it has implications for the study of prime numbers and cryptography.' Tragically, Mirzakhani died of metastatic breast cancer on July 14, 2017. She was just 40 years old.

Here are some mathematicians who made a considerable contribution to mathematics:

- Hypatia
- Emilie Du Chatelet
- Maria Gaetana Agnesi
- Emmy Noether
- Hanna Neuman
- Sophie Germain
- Ada Byron Lovelace
- Sonya Kovalevska
- Mary Fairfax Somerville
- Charlotte Angas Scott
- Karen Uhlenbeck
- Evelyn Boyd Granville
- Julia Robinson
- Grace Hopper
- Anna Pell Wheeler
- Maryam Mirzakhani

### TASK 1: FOR EACH MATHEMATICIAN

- Research when she lived and worked.
- Write a brief statement outlining the area of mathematics she worked in.
- Write a brief statement highlighting the important contribution she made to mathematics.
- Optional: Make a timeline, marking on this the time each woman worked.

## EDITION 6: WOMEN IN MATHEMATICS (CONT.)

### TASK 2: HIDDEN FIGURES

Watch the movie *Hidden Figures* about female mathematicians Katherine Johnson, Dorothy Vaughan and Mary Jackson who worked at NASA during the Space Race.

- Write a brief reflection on the movie, including:
  - comments on the contribution each mathematician made in NASA's work in the Space Race
  - the barriers each mathematician faced in her work.

### TASK 3: DIGGING DEEPER

Choose a mathematician from either the list on page 1, or one of the mathematicians in *Hidden Figures* that you would like to learn more about, or whose work in particular interests you.

- Prepare a short biography of this mathematician. Prepare a presentation of the biography that will be presented to your class. Be creative in your presentation, think of ways it could be presented to both a live audience and virtually, for example a PowerPoint with voiceover, a video clip, a podcast, video yourself acting out the story. In the biography include the following information:
  - How the mathematician got her education
  - More detail of the area of mathematics she worked in
  - Greater detail outlining the contribution she made to mathematics
  - How is her work still being used today or how has her work influenced today's mathematics?
  - How she told people about her work
  - What things made it difficult for her to work and study maths?
- Language – in your own words define any 'new' mathematical terms you learnt throughout this research.

### EXTENSION TASK

Watch the documentary: *Secrets of the Surface, the Mathematical Vision of Maryam Mirzakhani*. You could watch it on: <https://may12.womeninmaths.org/node/210> or <https://www.imdb.com/title/tt11858196/> or watch a preview of the movie and read a short biography of Maryam at <http://www.zalafilms.com/secrets/>.

### TEACHER NOTE

For Task 1, you may choose to group students into groups of four, and divide the task amongst the group. The students can collaborate to produce a timeline, marking on this the time each woman worked. Each student could choose a different mathematician to research.