Mathematician Presentation

~ Hypatia ~

Math 304-01

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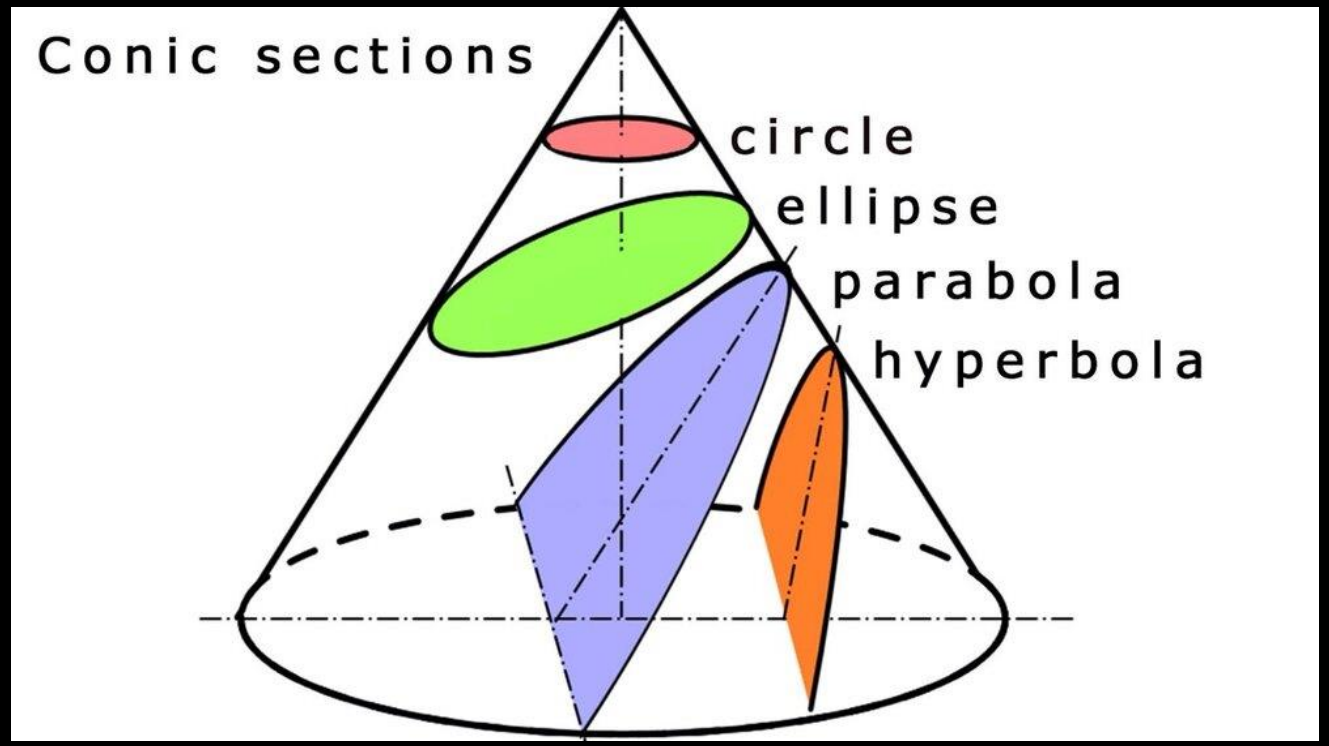
A brief overview of mathematics discovered by Hypatia

- Responsible for many mathematical works
- Several parts of her father's commentary on Ptolemy's *Almagest*
- The addition of Archimedes' *Measurements of the Circle*
- Work on areas and volumes reworking Archimedean material
- A text of isoperimetric figures related to Pappu's Book 5

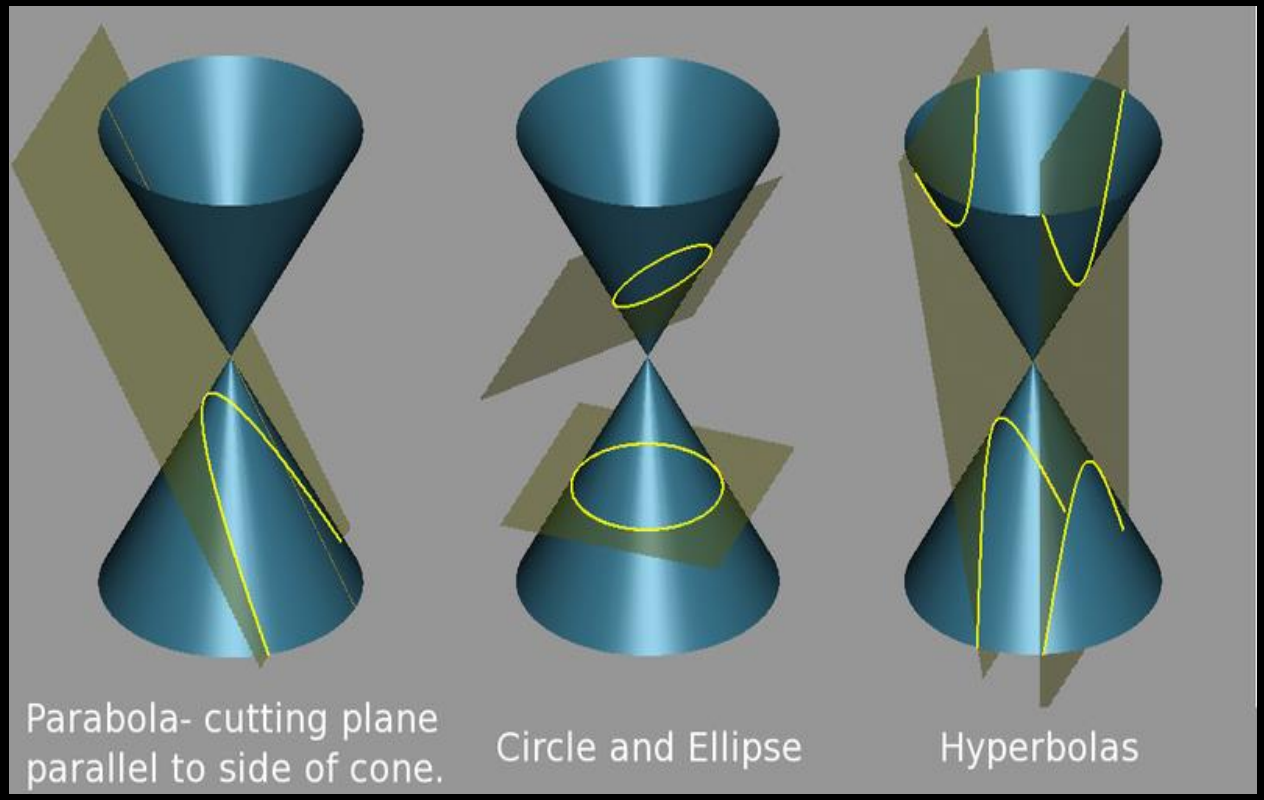
Explain the mathematics and how it was used



- Hypatia edited the work on the Conics of Apollonius and developed better ideas of hyperbolas, parabolas, and ellipses.

The 4 Conic Sections

In geometry, a conic section is the curve created when one cuts through a cone with a flat plane.



Section 1: **The Circle**
- This is the cross-section of a cone as cut to be a plane, perpendicular to the axis of that cone.

Section 2: **The Ellipse**
- This is the cross-section of a cone as cut to be a plane, slightly less than perpendicular to the axis of the cone.

Section 3: **The Parabola**
- This is the cross-section of a cone as cut to be a plane with one "side" of the cone parallel to the angle of the slope.

Section 4: **The Hyperbola**
- This is the cross-section of a cone as cut to be a plane, the cutting plane goes through the second nappe of the double cone.

Why did I concentrate on the Specifics of Conic Sections?

- These shapes are utilized in many disciplines of modern mathematics.

-Rocket Science:

Most orbits are ellipses.

Gravity pulls thrown objects down in a parabolic arc.

If a spaceship achieves escape velocity, its path is a hyperbola.

The importance of Conic Sections to the world

Architecture:

- 'Whisper Rooms' are constructed elliptically

- A cooling tower is in the shape of a hyperbolic surfac

Orbital Placement: Satellites are placed in elliptical orbits

Ethical issue that arose from the Hypatia

- Hypatia had many friends in Alexandria including Roman prefect, Orestes, but they were from the upper classes.
- The population supported the patriarch Cyril in his struggle with Orestes for control
- Cyril spread rumors about the famous woman philosopher and how she practiced sorcery as part of her philosophical, mathemati cal, and astronomical work. A group emerged that was willing to eliminate the 'satanic' figure
- Hypatia was killed and her death ended the Greek mathematical tradition of Alexandria

References

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