

Épreuve de section européenne

1 General knowledge

What is the definition of the limit of a sequence ? Give of few theorems about limits.

2 Document

The precise origins of the infinity symbol ∞ are unclear. One possibility is suggested by the name it is sometimes called – the lemniscate, from the Latin *lemniscus*, meaning “ribbon”. One can imagine walking forever along a simple loop formed from a ribbon.

A popular explanation is that the infinity symbol is derived from the shape of a Möbius strip. However, this explanation is improbable, since the symbol had been in use to represent infinity for over two hundred years before August Ferdinand Möbius and Johann Benedict Listing discovered the Möbius strip in 1858.

It is also possible that it is inspired by older religious/alchemical symbolism. For instance, it has been found in Tibetan rock carvings, and the ouroboros, or infinity snake, is often depicted in this shape.

John Wallis is usually credited with introducing ∞ as a symbol for infinity in 1655 in his *De sectionibus conicis*. One conjecture about why he chose this symbol is that he derived it from a Roman numeral for 1000 that was in turn derived from the Etruscan numeral for 1000, which looked somewhat like $\subset | \supset$ and was sometimes used to mean “many”. Another conjecture is that he derived it from the Greek letter ω (omega), the last letter in the Greek alphabet.

Adapted from *Wikipedia*, the free Encyclopedia.

3 Questions

1. What is a Möbius strip ? Who discovered it and when ?
2. Is it probable that the symbol ∞ is used because of its similarity with the Möbius strip ?
3. Who first introduced the symbol ∞ , and when ?
4. What may the object of Wallis' *De sectionibus conicis* be ?
5. Give three possible origins of this symbol.
6. There are four undefined operations involving the infinity. Cite them all and give at least one example of each.