

The Geometry of Time Travel.

I am reading *The Time Machine* by H. G. Wells at present.

The first chapter is fascinating, but requires several readings in order to begin to comprehend it.

The Time-traveller and his after-dinner guests begin to talk about Geometry.

The Time-traveller begins in the manner of Euclid.

He defines something of zero dimensions, i.e. a point: that *which hath no part*¹ in the words of Euclid in his *Elements*.

He defines a line as being of one dimension, i.e. that of length.

He defines a square as being of two dimensions, i.e. those of length, and breadth.

He defines a cube as being of three dimensions, i.e. those of length, breadth and height.

The Ancient-Greek word for ‘dimension,’ is ‘diástasis.’ The word ‘diástasis’ can be further broken down into the adverb ‘diá’ which means ‘apart,’ and the noun, ‘stásis’ which means ‘standing.’ The etymological sense is ‘a standing apart.’

A point has zero dimensions.

A line can be conceived as a point *standing apart* from another point.

A square can be conceived as a line *standing apart* from another line.

A cube can be conceived as a square *standing apart* from another square.

¹ “A point is that which has no part.” Euclid. *The Elements*. Book I. Definitions. *Euclid: The Thirteen Books of The Elements*. Translated with introduction and commentary by sir Thomas L. Heath. Second Edition. Dover Publications, Inc. New York. (1956. Kindle Edition.) Loc 5106.

The Time-traveller begins to ask whether a fourth dimension of space exists? Is there such a thing as a four-dimensional cube?

The answer may surprise you: a cube that occupies *four* dimensions of space *does* exist and is termed a 'tesseract.'

The term 'tesseract' is derived from the Ancient-Greek cardinal number, 'téssares, téssara,' which means 'four.'

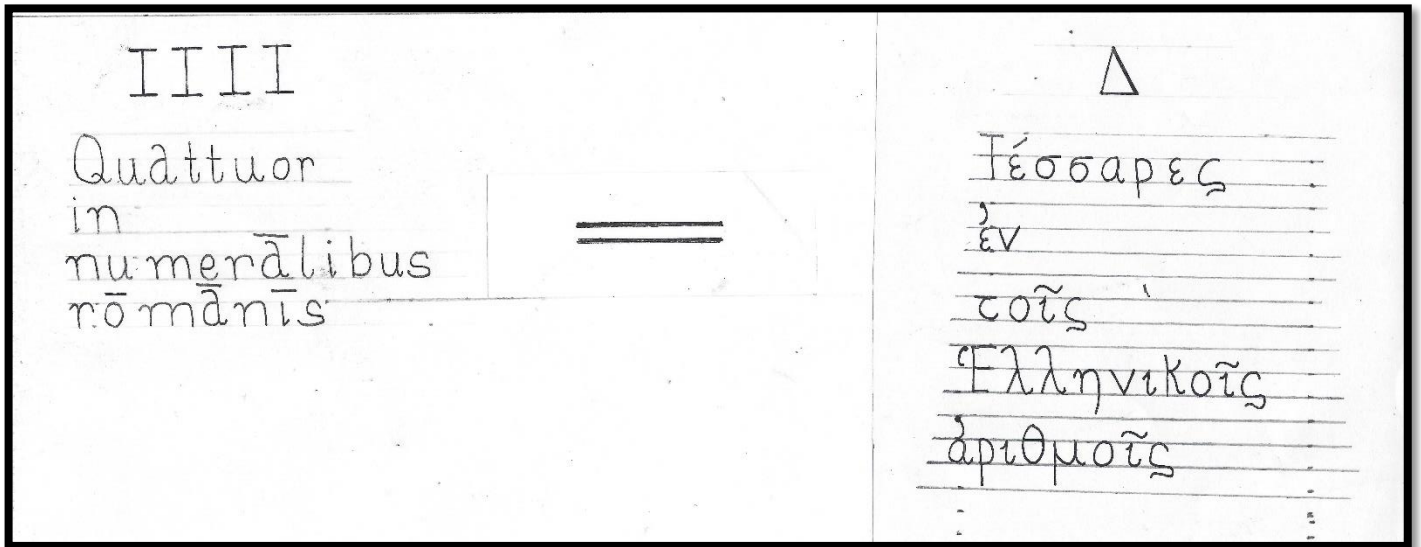


Figure 1: Four (IIII) in Roman Numerals is equal to four (Δ) in Ancient-Greek numerals. I hope that my Latin and Greek be correct.

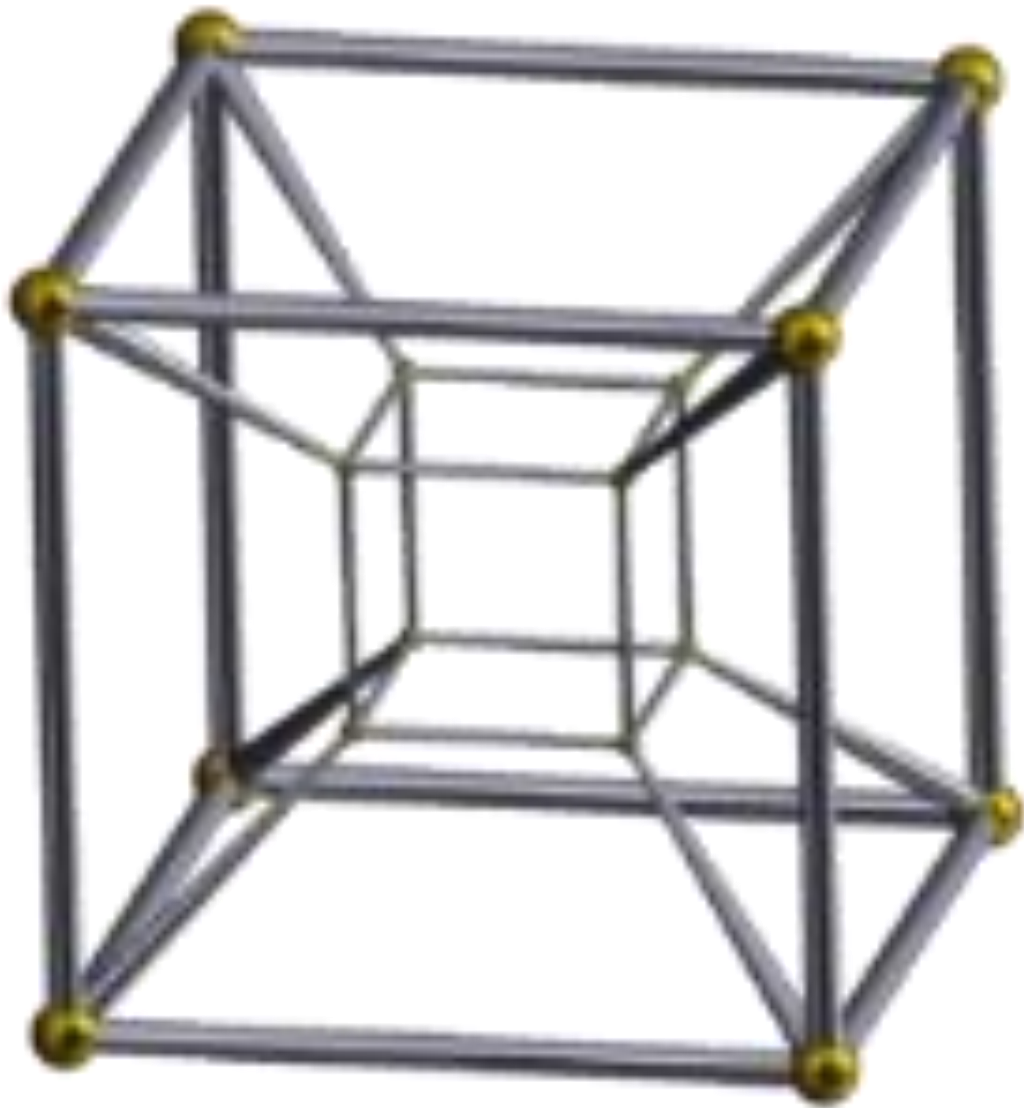


Figure 2: I lifted this illustration of a tesseract from Wikipedia. According to Wikipedia, the etymology of the word ‘tesseract’ is derived from the Ancient-Greek Cardinal Number, ‘téssares, téssara,’ which means ‘four,’ and the Ancient-Greek noun, ‘aktís,’ which means ‘ray.’ In Geometry, a line extends infinitely in two directions. In Geometry, a ray terminates at a point, and extends infinitely in one direction. In Geometry, a line segment terminates at two points.