

The 19th century had an enormous quantity of new methods which were contradictions of old beliefs.

1843, after years of cogitation, the Irish mathematician William Rowan Hamilton was led to invent his quaternion algebra in which the commutative law of multiplication does not hold. 42

1844 the German mathematician Hermann Grassman published the first edition of his remarkable *Ausdehnungslehre*, in which he developed classes of algebras of much greater generality than Hamilton's quaternion algebra. By weakening or deleting various of the laws of common algebra, or by replacing some of the laws by others that are also consistent with the remaining ones, an enormous variety of algebraic structures can be created. 43

Don't use just plain marks when you indicate a single space. They mean the same.

Hamilton and Grassman opened the world to abstract algebra. A mathematician can use any set of consistent axioms he chooses.

"There has never been a man like Newton, and there never will be one like him. Not Einstein, not Archimedes, not Galileo, not Plank, not anybody else measured up to near his stature.,,44 Newton in addition to formulating the laws of gravity invented differential and integral calculus. He developed systems to solve many problems which could not be solved until he solved them. Newton developed an excellent system of limits.

42 "Mathematics", Encyclopedia Americana, volume 17 page 400

43 Ibid

44 Petr Beckmann, A History of π , page 137

This paper just sort of dies here. How about a conclusion telling of the tremendous men you have covered. Make a statement. Make the reader feel the paper was worth reading! Most importantly - Conclude. It's as if you