Newton, Leibniz, and Berkeley

Isaac Newton is credited with the creation of calculus but there is debate as to whether Newton, or one of his contemporaries, Gottfried Leibniz should be created with the creation of calculus. The reason for this controversy can be attributed to a number of reasons. Leibniz wrote his method of calculus around 1673 but didn’t publish his work until 1684. Newton published his work on calculus titled, *Philosophiae Naturalis Principia Mathematica* in 1689, but he claims he came up with all the major ideas in 1666. If this was true this would mean Newton had created calculus before Leibniz. Unfortunately, there is no written proof that Newton created calculus in 1666 as he said he did. An interesting twist to the story is that Leibniz, who lived in Germany, took a trip to London in 1673 to talk with his contemporaries about developments in the field of mathematics. It was speculated that during this trip to London Leibniz gathered the necessary information to create calculus from mathematicians who had talked with Newton about his work. In order for this to be true one would have to believe that Newton was telling the truth about developing the ideas for calculus in 1666. The Wikipedia article titled, *Leibniz-Newton Calculus Controversy* states, “The last years of Leibniz's life, 1710–1716, were embittered by a long controversy with John Keill, Newton, and others, over whether Leibniz had discovered calculus independently of Newton, or whether he had merely invented another notation for ideas that were fundamentally Newton's” (Leibniz-Newton calculus controversy). John Keill was a Scottish mathematician who knew Newton and studied his work. Keill was said to be an instigator of the Newton-Leibniz controversy because he believed Leibniz had plagiarized Newton’s work. In 1704 Leibniz denied the claims that he had plagiarized Newton’s work. That same year Leibniz claimed that he was only the first to publish work about calculus, not necessarily the first to have invented it. In 1712 The Royal Society decides that Newton was the first to invent calculus. I don’t believe that there is enough evidence to prove or disprove Newton’s claim that he had the ideas for calculus in 1666 but didn’t publish them until later, although it is a convenient excuse if he actually didn’t invent calculus until later. I also don’t believe that there is enough evidence to assume that Leibniz copied Newton. I think both Newton and Leibniz came up with the ideas for calculus around the same time because the information and technology that was needed was available to both of them at the right time. Therefore, I think both Newton and Leibniz should be credited with the invention of calculus. I think Newton is more widely known today because of his publications in the field of mathematics, especially the *Philosophiae Naturalis Principia Mathematica,* and because of his work in other fields.

**Question 2**

The sections of, *The Analyst*, by Bishop Berkeley that I read criticized the use of values in calculus that are said to be one thing and are then changed to be another. In section 15 Berkeley states this as, ”You may indeed suppose anything possible: But afterwards you may not suppose anything that destroys what you ﬁrst supposed” (Berkeley 7). I believe Berkeley would be referring to values in equations that are set to zero because they are small values that do not significantly affect the overall result. I particularly like this line in section 15, “Whether you argue in Symbols or in Words, the Rules of right Reason are still the same” (Berkeley 7). Basically, Berkeley states that even complicated mathematics must follow the rules of reason. In section 35 of *The Analyst*, Berkeley goes on to use an example which requires some values to be equal and then those same values are supposed to not be equal. I think Berkeley’s critique is valid. In mathematics we assume things about equations without a detailed reason as to why or how those things affect the overall outcome of the equation.