Abstract
Newton's Calculus
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This research project is an exploration of Isaac Newton's life, the mathematical advances leading up to calculus, Newton's formulation of calculus, and the Calculus Controversy. Newton was a very intelligent man who made a lot of mathematical and scientific advances. His creation of calculus was not only due to his mathematical genius, but the synthesis of many pieces that other mathematicians had worked on before Newton. These mathematicians had come close to discovering calculus, but did not have the foresight that Newton had to combine all of the information cohesively. Unfortunately, Newton had a habit of delaying the publishing of his works to avoid controversy, which ironically led to one of the biggest controversies in the history of mathematics. Although Newton developed and wrote down his ideas much earlier, Gottfried Wilhelm Leibniz published his own version of calculus before Newton. Since it was unclear as to whether or not Leibniz had read Newton's work, there was a question of plagiarism. But the main debate was of priority - which would receive the credit for discovering calculus?

Isaac Newton’s Life
- Born in Woolsthorpe, Lincolnshire, England on December 25, 1642 (or January 4, 1643 by corrected calendar)
- Poor farmer’s son
- Poor family life
- Attended Free Grammar School in Grantham, England
- "idle" and "inattentive"
- Studied math on his own, mastering geometrical and "integration"
- Poor farmer’s son who seemed not to care about school
- Passed on his work
- Studied under Isaac Barrow
- Became Lucasian chair at Cambridge (1663)
- Calculus controversy
- Passed away (1727)
- Published his works to avoid controversy, which Ironically led to one of the biggest controversies in the history of mathematics. Although Newton developed and wrote down his ideas much earlier, Gottfried Wilhelm Leibniz published his own version of calculus before Newton. Since it was unclear as to whether or not Leibniz had read Newton's work, there was a question of plagiarism. But the main debate was of priority - which would receive the credit for discovering calculus?

Mathematical advances leading up to calculus
Newton - "If I have seen farther than others, it is because I have stood on the shoulders of giants" (Burton).
- Greek Mathematicians
- Method of Exhaustion
- Archimedes
- Volumes and surface areas of 3-D shapes
- "integration"
- Fermat
- Max and min for parabola
- Descartes and Huddle
- Normals to curves
- Barrow
- Passed on his work - very close to calculus - to his student Newton
- Calculus controversy
- Passed away (1727)

Conclusion
Sir Isaac Newton was a great mathematical mind, and although he was not the only one to discover calculus, he was the first and will always be remembered as such. His achievements stretch beyond calculus to science and astronomy (Burton, ). but he will always be known for discovering calculus. It is interesting that a poor farmer's son who seemed not to care about school would become such a great figure in academia. Thankfully, all of the right people stepped in and recognized his potential which led him to develop calculus.

Newton’s Calculus
De Methodus Serierum et Fluxionum (1671)
- Fundamental Theorem of Calculus
- Variables changing in relation to time
- Implied the inverse relationship between integration and differentiation
- Geometrical
- Poor notation
- Written for elite mathematicians
- Accepted in England
- Not accepted on the continent

Works Cited

The following is how Newton took a derivative:

Now since the moment at t equals zero is and at time t equals the indefinitely smalloj1 moments of time, it follows that there are two x and y equal indefinitely smalls.
Now by supposition x equals x equals y equals zero; which then being removed and the remaining terms divided by 0, there will remain.
But whereas x is supposed to be indefinitely little, it may remain the moments of quantity, corresponding to the increments y which are multiplied by it will be nothing in respect of the rest; therefore I express it, and there remains
which is Newton's first derivative.

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Footnote 35 - the power of y was probably supposed to be to the third instead of to the fifth
Note - today's notation is instead of "ds"