1. **Best Piece of Work**

My best piece of work for this class was most likely the ski jump project. It was my first attempt at writing the code for the project completely modularly (e.g. through using many variables rather than just manually computing coefficients for equations and typing them in). This organization allowed me to understand the math behind the equations well (specifically what each parameter represented graphically) and efficiently complete the project in a grader-friendly manner. As a result, I was able to experiment more with the graph and produce a neater shape (it used trigonometric functions for the landing slope and bowl) because I did not waste time retyping equations for functions.

Additionally, it was in this project that I first began to work completely in Mathematica rather than Desmos. While this shift had no outward effect on the quality of the final product, it was an important step for me because it allowed me to learn more about Mathematica (specifically about its syntax and how to use the documentation), and as a result I feel more comfortable attempting new tasks (such as the logistic regression for the oil data) using it.

1. **Favorite Topic**

My favorite topic for BC so far has been volumes by cross-sections. Although they were extremely difficult at times, the problems from the unit were very thought-provoking and challenged me to improve my grasp on the fundamental task of integration, which I had begun to take for granted and complete without actively thinking about the meanings behind the notation.

Two specific problems challenged me to think innovatively and abstractly about the topics. The first, the one in which I had to find the volume produced above the sliver cut off by the axis, was interesting because the solution I discovered (after staring blankly at the problem completely mystified) involved rotating the graph, which was somewhat new for me because up until then I had thought of the graphs of equations as rather static and not thought of transforming them as useful operations. The second, the one which involved calculating the volume of a sliver of a cone, brought me to consider the basic meaning of integration and how it could be used to calculate volume through double integrals. It also taught me not to rely on being able to solve problems in inefficient ways through the use of Mathematica, as in this case Mathematica could not solve the equation I initially created that involved a system of equations with integrals. I guess the reason I liked this topic so much was that the problems got me to think critically and surprise myself by figuring out how to solve seemingly-impossible tasks using just my prior knowledge.

1. **Strengths**

I believe that one of my strengths in math is frequently considering problems more abstractly and as a result discovering short cuts that simplify them. One example of this was on the first test last semester. A problem asked for the area of a region then, after another part of the problem, asked for the mean x value on an interval as well as the equations of the bounding curves in terms of y. I was able to realize that, although the presentation of the question implied that one should use the new equations for the bounding curves to calculate the area of the region, I had already calculated this area and could just divide by the y interval of the region. Although this was a rather insignificant problem, it highlights my ability to solve problems in quicker ways and as a result spend less time on them.

My most important strength in math, however, is probably that I am easily excited by the concepts. Since elementary school, I can remember being fascinated with numbers and their infinite patterns in a way that no other subject could replicate. This interest has enabled me to work on problem sets and think about new concepts in my own free time because such actions do not feel like work to me. In fact, they can at times be fun. There have been a number of times this year where I have found myself working on a PSet or chatting with friends about a lab on Friday or Saturday nights. As a result, I have been able to keep up with the coursework and material throughout the year.

1. **Use of material outside of class**

One of my primary interests over the past few years has been data analytics. I have taken on a few projects over the past year to try to expand my abilities in machine learning algorithms. One such project has been developing an algorithm capable of distinguishing between reliable and unreliable news sources. My knowledge of calculus, especially knowing how to analyze a function’s equation determine certain characteristics of the graph such as end behavior and frequency of critical points, as a result of BC has greatly improved my ability to gain a rough understanding of how certain neural network algorithms work and why certain functions are used over others for tasks such as the activation of a neuron, so as a result I have been able to make adequate use of them.

Aside from specific programming concepts that involve calculus, the problem-solving skills that I have learned from BC have improved my programming abilities in general. For instance, in one assignment for Data Structures (H) in January, we were tasked with building a binary search tree from a dataset and allowing the user to perform a number of functions on the tree. While most of these functions were relatively simple to implement, the delete method proved quite challenging as a result of the need to fill any potential vacuum in the tree and the vast number of cases it was necessary to cover. At first I jumped into the code and tried to program it without having in mind an initial outline of how the program would work, but I grew increasingly frustrated. Finally, I resorted to using a whiteboard just like when I am stumped in BC. I drew out all of the possible cases and the actions that would have to happen in each case, and within twenty minutes of completing the outline on the whiteboard, I was finished with the program.

1. **Accomplishment in class that represents growth**

Solving the dog problem in class at the end of last semester is one of the accomplishments that I feel best represents my growth in the class. While it is not the most difficult or longest problem I have done in BC, the problem stands out because of the applicability of the solution to the real world. It is the kind of problem that up until this year I was unable to solve because it contained an added layer of complexity (in this case a changing rate, but other examples include adding something infinitely or approaching a value without actually getting there) that I was incapable of addressing yet very common throughout real life. To me, the fact that I was able to apply calculus to solve such a problem was quite enthralling, and it reminded me why I enjoy math so much.