Reflection 3: Productive Failure
MATH 1700: Ideas in Mathematics

Professor Rimmer

Due: March 24, 2023   **Denny Cao**

One of the themes in this class has been learning from failed attempts. Pick one or two instances in this class when a wrong idea turned out to be enlightening, or where you failed more generally in a way that was ultimately beneficial. Expand on the incident(s) in a little more detail than the failure question on your second-round homework submissions. Try to avoid discussion of grades and right/wrong solutions and focus more on the actual learning, including specific course content. A short paragraph or two will likely be sufficient.

Taking MATH 1700 has reinforced my understanding of discrete mathematics, and one instance of this being the case was when we were working with functions and learning what it means for a function to be injective, surjective, and bijective. After a few months away from my discrete mathematics course, I forgot what it meant to be a function. I believed that all functions are injective, as a function must be defined for all x in the domain, and injectivity means that every x maps to a unique y. However, I did not realize that it did not say anything about **all** x. The definition of injectivity, $\forall x, y (f(x) = f(y) \rightarrow x = y)$, does not say that every x maps to a unique y; rather, it says that, two elements in the domain cannot map to the same element in the codomain. I learned that a function is where all elements in the domain map to an element in the codomain, which is why even piecewise functions and $f(x) = \sqrt{x}$ are functions, as their domains are restricted to only where x is defined.