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## An Arithmetic Expedition

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## **Cover Page Footnote**

Thanks to Dr. Lynette Breedlove for editing and brainstorming initial ideas. I appreciate the critiques from Caleb Stickney, my mother, my father, and a pair of others.

A geek straight to his heart, Mr. La Mar loved teaching mathematics. As he engaged us with constructing origami dodecahedrons and symmetric art, he shared glimpses of our future in math, where real world constructions analogue theoretical sets and algebraic rings. My eighth-grade self took these notions to heart. By year's end, I made a pact to complete as many math courses as possible, and to love and understand the world's problems through the eye of a scientist.

Turning the corner of this newfound weight, I rustle through the first pages of Calculus, the beginning of higher mathematics. Ms. Perkins enthusiastically exclaims the glories of the subject, striking me speechless as differentiation is revealed and the past problems of minima and maxima become smoothly solvable. With the same fervor felt for mathematical discoveries, I begin to solve problems in my own life. As a sophomore, I improve my efficiency in order to spend all the time I can on what really matters. For the sake of progress, I ponder, "How many apples can I take from the cafeteria to keep from walking down to breakfast?" I question, "Is it appropriate to run between classes, or is a brisk walk the matchless mix of conspicuity and speed?" I solve these questions through experimentation, analysis driven by a desire to maximize time.

I dig further, through Taylor's Theorem and Harmonic Series to the next topic: Linear Algebra. With Dr. Munasinghe's harsh Indian staccato, problems become more difficult. However, when I meet with her during office hours to discuss a challenging proof, I find that we are one. We are two mathematicians of different backgrounds, connected by the hope of solutions to real, tangible problems.

In class, physics is reinterpreted in the lens of vector spaces, and million-row matrix equations become solvable with Gaussian elimination. With this rise in intricacy comes a leap in complexity in my own strides towards efficiency. I realize I can study Chinese characters more effectively with technology than with traditional paper and pencil. Finding no adequate solutions, I turn to my ideas. I've been working with Java recently, so why not write an Android app? I type through dusk as code documentation fills my monitor, and eventually publish my app on the Google Play store.

My next textbook takes me into Numerical Analysis. As Dr. Robinson makes baffling mathematical leaps in his lectures, I see that the support provided by concrete examples has faded. Multiple choice questions are replaced by page-long proofs, as Lagrange Error Bounds are requested and heuristic algorithms replace certainty. Part of me longs for the old days of straightforward, function-filling life. Deep down, though, I know that reading, understanding, and learning to forge my own work will undeniably prove more useful for the future. As I see myself growing in math, I begin to realize life is more complex than binary. My social relationships cannot be solved with simple life hacks and instead require time. I must strike a balance between social life and achievement, to mix between the steady beat of work and the punctuated melody of enjoyment that springs from my friends' laughter. Notwithstanding this system's seemingly impossible optimization, I still experiment to find a solution that offers at least a local extrema.

I gaze ahead, considering the endless stacks of knowledge abounding my future. I see those I am thankful for, those who have helped me reach this point. I see the brilliance in those who will strive alongside me with tomorrow's unsolved problems. And though I know help will become more scarce and solutions infinitely more difficult to find, I believe that no matter how hard it may seem, answers exist and are there for my taking.