Equations. Solving them. Interpreting them. Constructing from real-world phenomena. You’ve had to understand equations a lot in your life, no? The geometric properties are related to the famous equation $a^2 + b^2 = c^2$. The length of time for a ball to drop to the ground is related to $t^2 + dt + e = 0$. You may not realize it, but the security of your last internet purchase is based on understanding equations like $g^2 = A$. In each of these examples, equations are used as mathematical reflections of reality. Elementary Number Theory (MATH B290) is an introduction to fundamental ideas about equations, with the focus on whole numbers: 1, 2, 3, . . .

The term elementary is used here with the same meaning as in elementary particle, which is to say that we will deal with numbers as basic elements. They will guide us as we encounter worlds you haven’t seen before. We will learn to use our elements, the numbers, to do math on a clock. We will use them to travel along imaginary directions. This will all be in the service of understanding the fundamental process of what it means to study and solve equations. By the end, you will not longer ask “Can you solve the equation?” but rather “Where can you solve the equation?” You will train your mind with logic, to provide rigor and strength to your ideas.

Having moved into mysterious realms beyond the usual numbers, we will return the real, modern, world. By the end of the course, you should understand the basic ways in which the equation $g^2 = A$ is related to the cryptographic techniques modern computers use to keep your personal data secure.

p.s. Yes, you can. Let $a = 171$ and let $b = 227$. 