Abstract: The real numbers probably feel very concrete or, for lack of a better word, "real" to most students of calculus. Later, students in mathematics learn that the field of real numbers is even bigger than one might imagine when they see Cantor’s diagonal argument and learn that the reals are an uncountable set. Nevertheless, most real numbers, like $e$ and $\pi$, likely still feel very real. Why? Because there are specific ways to compute them to any desired level of accuracy. In other words, most of the real numbers we know are computable. In this talk, we will explore what the notion of computability means, and discover the (perhaps startling) fact that most real numbers are not computable. We will end with a discussion of a famous computability problem in mathematics, known as Hilbert’s 10th problem: is there way to determine if a polynomial equation over the integers like $2x^2 + 3y^3z = 4$ has a solution in the integers?