Product Metrics

1 Why

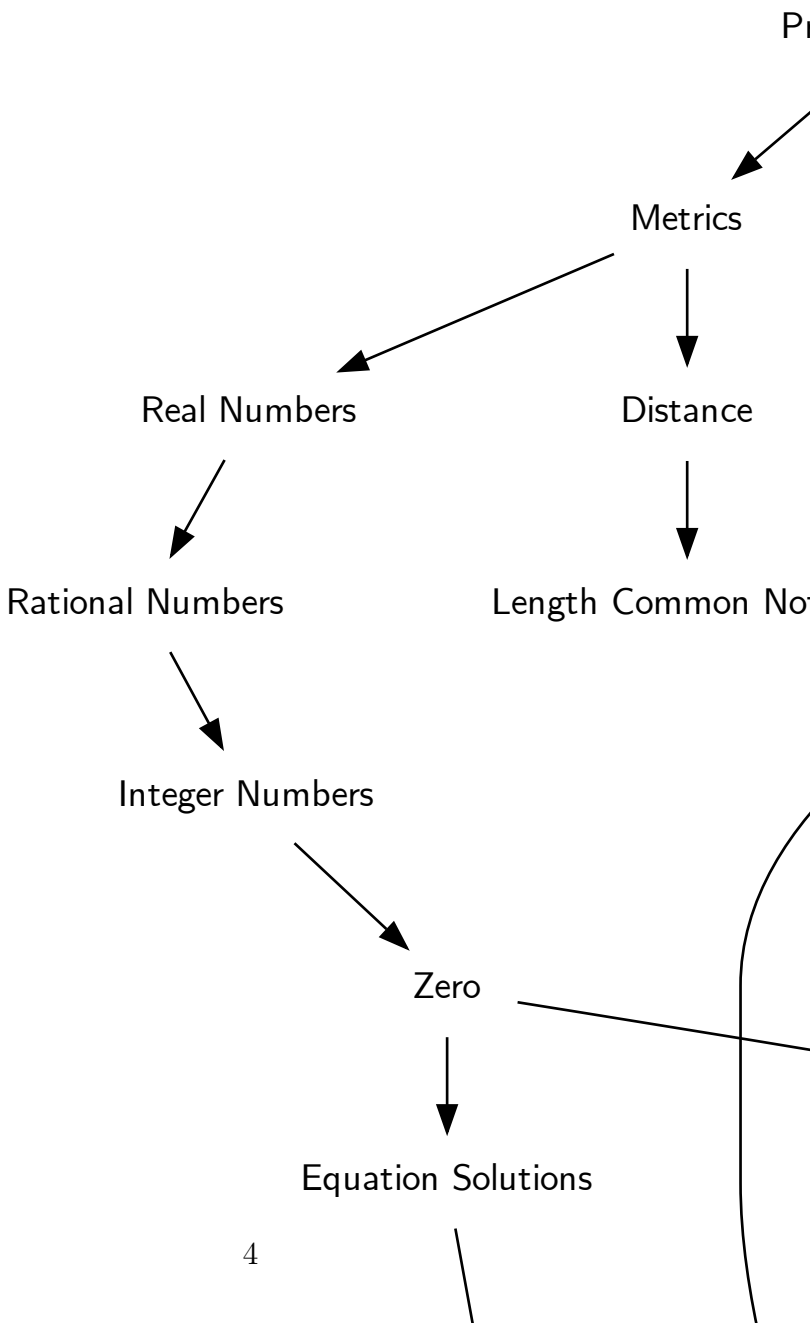
Given n sets each with metrics, there is a standard way of turning the direct product of the sets into a metric space. In other words, defining a distance on the tuples of elements from the sets.

2 Motivating Result

Proposition 1. *Let $(A_1, d_1), (A_2, d_2), \ldots, (A_n, d_n)$ be metric spaces. Let A be $\prod_{i=1}^{n} A_n$ and let R be the set of real numbers. Define $d : A \times A \to R$ by*

$$d(a, b) = \max\{d_1(a_1, b_1), \ldots, d_n(a_n, b_n)\}.$$

Then (A, d) is a metric space.


Pr
Metrics
Real Numbers
Distance
Rational Numbers
Length Common No
Integer Numbers
Zero
Equation Solutions