Here is a short description of Diophantine Equations.

This is the question, whether an indeterminate polynomial equation has solutions where the variables are instantiated as integers.

Examples:

- Solve for integers $a, b$ the equation $ax + by = 1$ using integers $x, y$.
- Solve for given $n$ the equation $x^n + y^n = z^n$.
  - For $n \geq 3$ this is unsolvable by Fermat’s Last Theorem.