
Principle: When the set S consists of numbers and is finite, the value of a number belonging to S cannot be decreased infinitely often, always to a distinct number belonging to S .

Examples presented in class:

- $\sqrt{2}$ is irrational.
- For a positive integer k , \sqrt{k} is irrational if it is not an integer.
- No integral solutions to $a^2 + b^2 = 3(s^2 + t^2)$, other than the trivial solution $a = b = s = t = 0$.
- *Sylvester-Gallai theorem*: If there are n ($n \geq 3$) points on the plane such that not all on a line, then there exists a line passing through exactly two of these points.