

INTRODUCTION TO NUMBERS THEORY

Based on the basic theorem of arithmetic:

$$\forall a \in \mathbb{N}:$$

$$a = 2^n * 3^m * 5^s * 7^t * q$$

$$n, m, s, t \in \mathbb{N}_{\{0\}}; q \in \mathbb{Q};$$

$$Q = \mathbb{N} \setminus \left[\bigcup_{n \in \mathbb{N}} 2n \right] \setminus \left[\bigcup_{n \in \mathbb{N}} 3n \right] \setminus \left[\bigcup_{n \in \mathbb{N}} 5n \right] \setminus \left[\bigcup_{n \in \mathbb{N}} 7n \right]$$

Then:

$$\mathbb{N} = \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 2^n \right] \times \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 3^n \right] \times \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 5^n \right] \times \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 7^n \right] \times \left[\bigcup_{q \in \mathbb{Q}} q \right]$$

Cause:

$$\left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 2^n \right] \times \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 3^n \right] \cap \left[\bigcup_{n \in \mathbb{N}} (6n \pm 1) \right] = \emptyset$$

Then:

$$\left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 5^n \right] \times \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} 7^n \right] \times \left[\bigcup_{q \in \mathbb{Q}} q \right] = \left[\bigcup_{n \in \mathbb{N}_{\{0\}}} (6n \pm 1) \right]$$

And:

$$Q = \left[\{1\} \cup \left[\bigcup_{q \in \mathbb{Q}} q \right] \right] = \left[\bigcup_{a \in \mathbb{N}_{\{0\}}; b \in [P_{\{2,3,5,7\}} \cup \{1\}]} b(6a \pm 1) \right]$$

And then:

$$P \subset \left[\{2, 3\} \cup \left[\bigcup_{a \in \mathbb{N}} (6a \pm 1) \right] \right]$$