COL202: Discrete Mathematical Structures

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Tutorial Sheet - 1

3.

a) Twin Prime Conjecture:

$\forall n \in \mathbb{N}, \exists x \in \mathbb{N}, x \geq n : p(x) \wedge p(x+2)$

Negation of Twin Prime Conjecture:

$\exists n \in \mathbb{N} : \forall x \in \mathbb{N}, x \geq n \quad p(x) \Rightarrow \neg p(x+2)$

b) Bertrand's Postulate:

$\forall n \in \mathbb{N}, \exists x \in \mathbb{N}, n < x \leq 2n : p(x)$

c) $\forall n \in \mathbb{N}, \exists x \in \mathbb{N}, x \geq n : p(x) \wedge \forall i \in \{0, 1, \ldots, \lfloor \log_{10} x \rfloor\}$

$\left\lfloor \frac{x}{10^i} \right\rfloor \% 10 \neq 7$