Filename

Author Name

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Chapter 1.
Sample Heading!!

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1.1. Sample Subheading‼

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Theorem 1 (No largest prime): There is no largest prime.

Proof: We prove by contradiction. Assume that there is a largest prime. Hence there is a set of primes $P = \{2, 3, 5, ..., p_n\} \subset \mathbb{N}$. Then consider:

$$q = \prod_{p \in P} p$$

As $|P|$ is finite, q must be too. Further note that $\forall p \in P, p \mid q$. Hence $\forall p \in P, p \nmid (q + 1)$. So $q + 1$ is coprime to all primes and must therefore also be prime, a contradiction. ■

Corollary 2: There are infinitely many primes.