

MAT246 Concepts in Abstract Mathematics

Midterm Theorem Checklist

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1 Chapter 1

Lemma 1.1 (1.1.1). Every natural numbers greater than 1 has a prime divisor.

Proof. Iteratively factorize n . ■

Theorem 1.1 (1.1.2). There's no largest prime.

Proof. (Contradiction) Let p_n be the largest prime and consider

$$M = p_1 p_2 \dots p_n + 1$$

■

2 Chapter 2

Theorem 2.1 (2.1.1 PMI). $S \subset \mathbb{N}$ and

1. $1 \in S$.
2. $k \in S \implies k + 1 \in S, \forall k \in \mathbb{N}$.

then $S = \mathbb{N}$.

Proof. (WOP and Contradiction)

Let $T = S^c$ and show that $T = \emptyset$. ■

Theorem 2.2 (2.1.2 WOP). $T \subset \mathbb{N} \wedge T \neq \emptyset \implies \exists \min\{T\}$

Proof. (Contradiction)

Let $T \neq \emptyset, t = \min\{T\}$.

Then $t - 1 \notin T \implies t - 1 \in S \implies t - 1 + 1 = t \in S$. ■

Theorem 2.3.