

Tensor Products II

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Lecture Notes

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1 INTRODUCTION

2 TENSOR PRODUCTS OF LINEAR MAPS

Example 2.1

Example 2.2

Theorem 2.3

Example 2.4

Theorem 2.5

3 FLAT MODULES

4 TENSOR PRODUCTS OF LINEAR MAPS AND BASE EXTENSION

Theorem 4.1

Theorem 4.2

In *Modules over a PID*, Theorem 2.13, Corollary 2.15, and Theorem 4.2.

Example 4.3

In *Tensor Products I*, Theorem 6.7, Example 6.8, Theorem 6.11.

Theorem 4.4

In *Tensor Products I*, Theorem 6.7

Example 4.5

Theorem 4.6**Example 4.7****Example 4.8**

A $\mathbb{Z}/p^2\mathbb{Z}$ -module homomorphism $\phi : \mathbb{Z}/p\mathbb{Z} \rightarrow \mathbb{Z}/p^2\mathbb{Z}$ is determined by its value on $1 = 1 + p\mathbb{Z}$. Can it be a number $0 < k < p$? Then $\phi(k + p - k) = \phi(k) + \phi(p - k) = k + p - k = p = p + p^2\mathbb{Z}$, but in $\mathbb{Z}/p\mathbb{Z}$, the argument is $p = 0$ ($p + 3\mathbb{Z} = 0 + \mathbb{Z}$), then $\phi(0) = 0$ ($0 + p^2\mathbb{Z}$), a contradiction.