

2022-23 MATH2048: Honours Linear Algebra II

Homework 3

Due: 2022-09-30 (Friday) 23:59

For the following homework questions, please give reasons in your solutions. Scan your solutions and submit it via the Blackboard system before due date.

1. Given an ordered basis β for a finite-dimensional vector space V over field F , show that the mapping T defined below is linear.

$$\begin{aligned} T : V &\longrightarrow F^n \\ \vec{x} &\longmapsto [\vec{x}]_\beta \end{aligned}$$

That is to prove $[a\vec{x} + \vec{y}]_\beta = a[\vec{x}]_\beta + [\vec{y}]_\beta$ for any $\vec{x}, \vec{y} \in V$ and $a \in F$.

2. Sec. 2.1: Q31
3. Sec. 2.1: Q32
4. Sec. 2.2: Q4
5. Sec. 2.2: Q12

The following are extra recommended exercises not included in homework.

1. Sec. 2.1: Q35
2. Sec. 2.1: Q37
3. Sec. 2.2: Q11