MATH Math 162A Review: Abstract Vector Space

1. We define

$$V = \left\{ \sum_{k=0}^{\infty} a_k x^k \mid a_k \in \mathbb{R},\ \forall k \in \mathbb{Z} \right\}$$

be the set of all *formal* power series (in the sense that we don't consider its convergence). Then V is a vector space.

Let

$$V_1 = \{ f \in V \mid \text{the series is absolutely convergent} \}$$

Then V_1 is a subspace of V.

Solution:

2. Prove that the functions $\{e^x, \sin x, \cos x\}$ are linearly independent.

Solution: