Homework 4 - Proof

"Proof that if a set of vectors $\{e_i\}$, $e_i \in \mathbb{R}^m$ are linearly independent and if $V = \sum_i x_i e_i$, $x_i \in \mathbb{R}$ Then the repesentation is unique

↳ Solution:

$\{x_i\}$ must be the only set of scalars that represent V if is unique

then let's asume there exists a different set $\{y_i\}$ where

$$V = \sum_i y_i e_i$$

but since both expressions are equal to V, then:

$$V = \sum_i x_i e_i = \sum_i y_i e_i \longrightarrow \sum_i (x_i - y_i) e_i = 0$$

this must be zero, then

$$x_i - y_i = 0 \longrightarrow x_i = y_i$$

← Unique representation