Contents

0.1 Endomorphisms form a vector space

An endomorphism maps a vector space onto itself.

$end(V) = \hom(V, V)$

Need to show that endomorphism is a vector space

Essentially

$v \in V$

fF

$av = f$

$bv = g$

$(a \oplus b)v = f + g$

$(a \oplus b)v = av + bv$

so there is some operation we can do on two members of endo

linear in addition. That is, if we have two dual "things", we can define the addition of functions as the operation which results int he outputs being added.

what about linear in scalar? same approach.

Well we define

$c \odot a) = cav$

There is a unique endomorphism which results in two other endomorphisms being added together. define this as addition

0.2 Dimension of endomorphisms

$\dim(end(V)) = (\dim V)^2$

0.3 Basis of endomorphisms