0.1 Homomorphisms form a vector space

If we can can show that scalars can act on morphisms, then we can shwn that morphisms on a vector space are themselves a vector space.

Scalars can act on morphisms, and so morphisms of vector spaces are themselves vector spaces.

0.1.1 Dimensions of homomorphisms

We can identify the dimensionality of this new vector space from the dimensions of the original vector spaces.

$\dim(\hom(V, W)) = \dim V \dim W$