

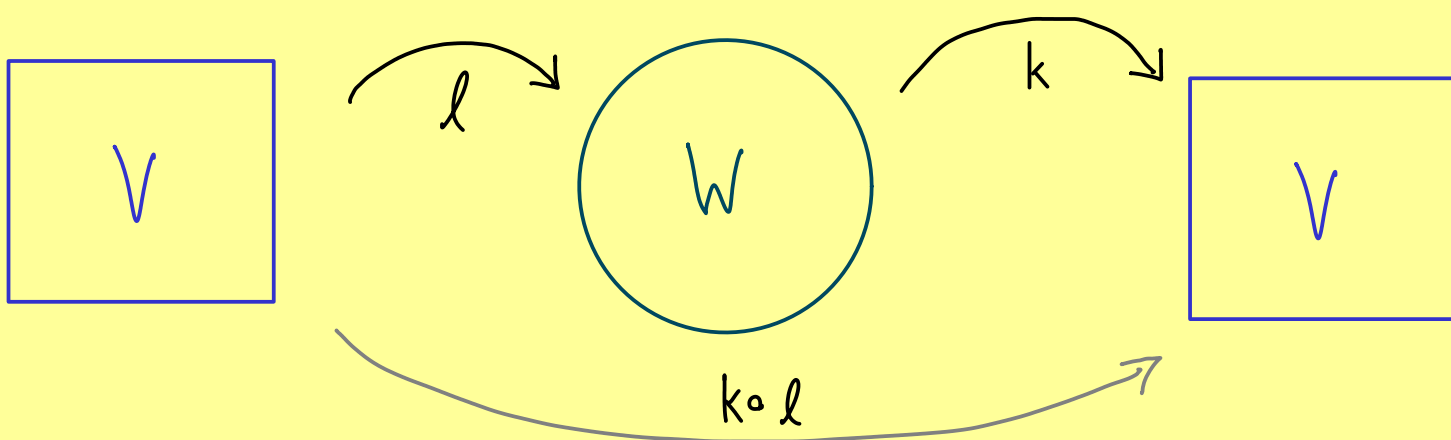
The Bright Side of Mathematics



Abstract Linear Algebra - Part 24

$l: V \rightarrow W$ linear map preserves the structure of the vector space.

\equiv
(vector space) homomorphism



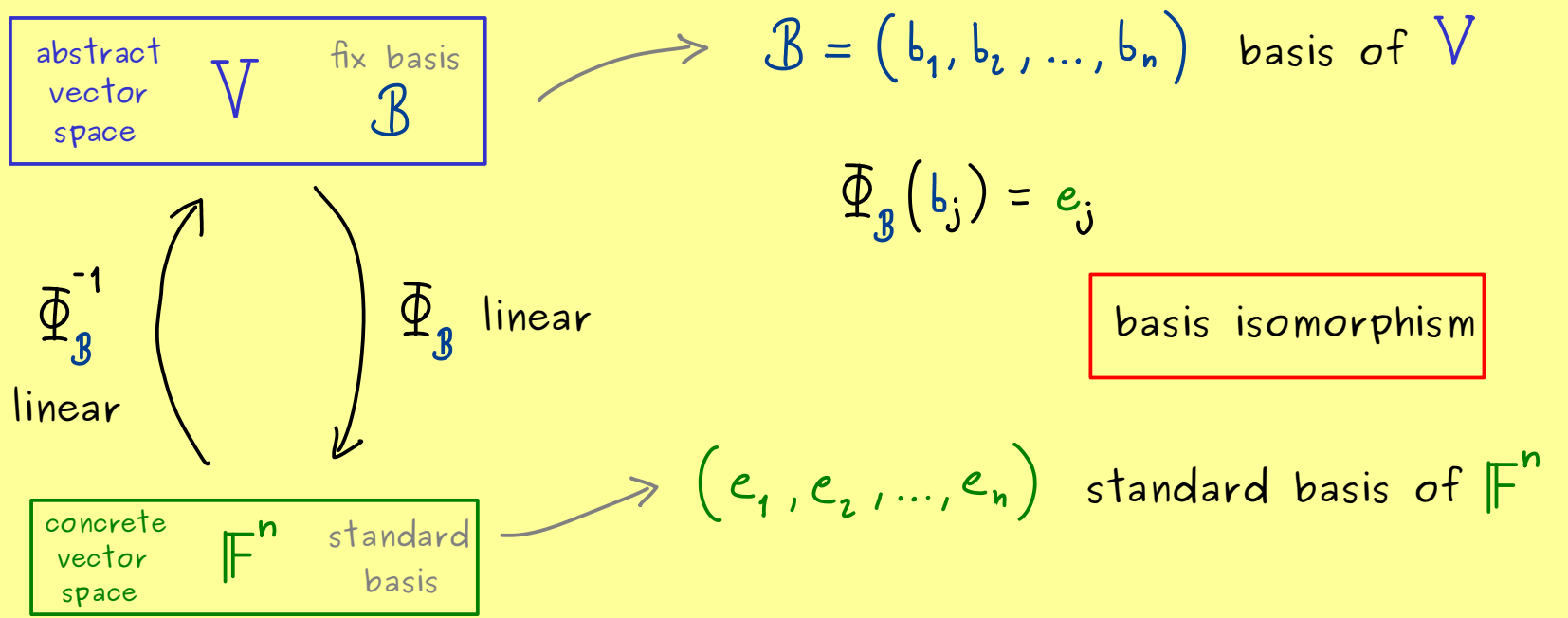
Reminder: (just maps on sets) $f: V \rightarrow W$ is called invertible if there is a map $g: W \rightarrow V$ with $g \circ f = id_V$ and $f \circ g = id_W$
 \rightarrow denoted by f^{-1}

f bijective $\iff f$ invertible

Fact: $l: V \rightarrow W$ linear + bijective $\implies l^{-1}: W \rightarrow V$ linear

(see part 31 in "Linear Algebra")

Example:



Definition: $l: V \rightarrow W$ homomorphism + $l^{-1}: W \rightarrow V$ homomorphism

\rightsquigarrow is called an isomorphism

Remember: (vector space) isomorphism = bijective linear map
 \equiv
 linear isomorphism