Work Sheet week 6

mandag 5. februar 2018 15:22

C.1

A set $\{\boldsymbol{v}_1, \boldsymbol{v}_2, \dots, \boldsymbol{v}_m\}$ of vectors in $\mathbb{C}^n$ is linearly independent if and only if none of the vectors in the set can be written as a linear combination of other vectors in the set.

The *span* of a set $\{\boldsymbol{v}_1, \boldsymbol{v}_2, \dots, \boldsymbol{v}_m\}$ of vectors in $\mathbb{C}^n$ is the set of points that can be written as a linear combination of the vectors in the set.

A transformation $T : \mathbb{C}^m \to \mathbb{C}^n$ is *linear* if and only if $T(\boldsymbol{v} + \boldsymbol{u}) = T(\boldsymbol{v}) + T(\boldsymbol{u})$ and $T(\lambda \boldsymbol{v}) = \lambda T(\boldsymbol{v})$

A transformation $T : \mathbb{C}^m \to \mathbb{C}^n$ is *onto* if and only of the *range* of T is the entire $\mathbb{C}^n$

A transformation $T : \mathbb{C}^m \to \mathbb{C}^n$ is *one-to-one* if and only if $T(\boldsymbol{v}) = T(\boldsymbol{u}) \Leftrightarrow \boldsymbol{u} = \boldsymbol{v}$ for all **u** and **v**

C.2

Case: $n < m$

The function cannot be injective, and can be surjective.

Case: $n > m$

The function cannot be surjective, and can be injective

Case: $n = m$

The function can be both injective and surjective

C.3

$f(x) = e^x$

Is injective but not surjective

$f(x) = x$

Is both injective and surjective

$f(x) = x^3 - 3x$

Is surjective but not injective

$f(x) = x^2$

Is neither injective nor surjective

C.3

Ble litt mye annet å gjøre denne uken…