Cheatography

Defintion of Vector Space

commutativity u+v = v+u

a(b*v*)

F

Vector Space = V + (+) + (*)

additive identity $\exists 0 \in V: v + 0 = v$

multiplicative identity 1v = v

 $v \in V$ = vector v point

associativity $(u+v)+w = u+(v+w) \land (ab) v =$

additive inverse $\forall v \in V, \exists w \in V: v+w=0$

distributive property $a(v+w) = av + aw \forall a \in$

SECTION 1

C, Fields, Lists, Fⁿ, Vector Spaces

Definition of complex numbers (n∈C)

C = { a+bi : a,b ∈ *R* }

addition in C (a+bi) + (c+di) = (a+c) + (b+d)i multiplication in C (a+bi)(c+di) = (ac-bd) + (ad+bc)i

Properties of Fields

commutativity $a+b = b+a \land ab = ba \forall a, b \in F$ associativity $(a+b)+c = a+(b+c) \land (ab)c =$ $a(bc) \forall a, b, c \in F$

identities $c+0 = c \land 1c = c \forall c \in F$

additive inverse $\forall a \in F \exists b \in F : a+b = 0$

 $\label{eq:multiplicative inverse} \begin{array}{l} \textbf{multiplicative inverse} \ a \in \textbf{F}, \ a \neq 0, \ \exists b \in \textbf{F}: \\ \textbf{a+b} = 0 \end{array}$

distributive property $c(a+b) = ca + cb \ \forall a,b,c \in F$

Definition of list L with length n

 $n \in \mathbb{N}, L : \{ 1, 2, \dots, n \} \rightarrow Elements$

 $L = (x_1, ..., x_n)$

Definition of Fn

 $F^{n} = \{ (x_{1},...,x_{n}) : x_{j} \in F \text{ for } j = 1,...,n \}$

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addition in F^{n}(x_{1},...,x_{n}) + (y_{1},...,y_{n}) =
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(x₁+y₁,...,x_n+y_n)

zero vector 0 = (0,...,0)

additive inverse For $x \in F^n$, $-x \in F^n = (-x_1,...,-x_n)$

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scalar multiplication in \mathbf{F}^{\mathbf{n}} c \in \mathbf{F}, c(x_1,...,x_n)
= (cx_1,...,cx_n)
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Definition of addition and scalar multiplication

addition on a set $V + : (U, V \in V) \rightarrow U + V$

scalar multiplication on a set V^* : ($c \in F$, $v \in V$) $\rightarrow cv$



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