

List of Symbols

Standard Symbols

$\mathbb{N} = \{1, 2, 3, \dots\}$	The natural numbers
$\mathbb{Z} = \{\dots - 1, 0, 1, 2, \dots\}$	The integer numbers
\mathbb{R}	The real numbers
$\overline{\mathbb{R}} = \mathbb{R} \cup \{+\infty\}$	The extended real numbers
$\overline{\mathbb{R}}_+ = \{\alpha \in \overline{\mathbb{R}} \mid \alpha \geq 0\}$	The non-negative extended real numbers
\mathbb{C}	The complex numbers
$\Gamma = \{\gamma \in \mathbb{C} \mid \gamma = 1\}$	The unit circle of \mathbb{C}
\mathbb{K}	Stands for either \mathbb{R} or \mathbb{C}
\mathbb{B}	Unit ball of a normed space
\mathbb{B}^*	Dual unit ball of a normed space

Special Symbols

$\mathcal{P}, \mathcal{Q}, \mathcal{N}, \mathcal{M}$	Cones, I.1
$\mathcal{V}, \mathcal{W}, \mathcal{U}$	Abstract neighborhood systems for cones, I.1
$(\mathcal{P}, \mathcal{V}), (\mathcal{Q}, \mathcal{W}), \dots$	Locally convex cones, I.1
$\overline{\mathcal{V}} = \mathcal{V} \cup \{0, \infty\}$	augmented neighborhood system, I.1.4, II.2.2
$\mathcal{F}(X, \mathcal{P})$	Cone of all \mathcal{P} -valued functions on X , I.1.4
$(\mathcal{F}_{\widehat{\mathcal{V}}}(X, \mathcal{P}), \widehat{\mathcal{V}})$	Locally convex cone of \mathcal{P} -valued functions on X , I.1.4
$(\widehat{\mathcal{P}}, \widehat{\mathcal{V}})$	Standard completion of a locally convex cone $(\mathcal{P}, \mathcal{V})$, I.5.57
$(\mathcal{P}_{\mathcal{V}}, \mathcal{V})$	Standard full extension of a quasi-full locally convex cone $(\mathcal{P}, \mathcal{V})$, I.6.2
$\sigma(\mathcal{P}, \mathcal{P}^*)$	Weak topology on \mathcal{P} , I.4.6
$\mathcal{O}(\mathcal{P})$	Order topology on \mathcal{P} , I.5.43

$o(\mathcal{P}, \mathcal{P}^*)$	Weak order topology on \mathcal{P} , I.5.49
$L(\mathcal{N}, \mathcal{M})$	Cone of linear operators from \mathcal{N} to \mathcal{M} , I.7
$\mathfrak{L}(\mathcal{P}, \mathcal{Q})$	Cone of continuous linear operators from \mathcal{P} to \mathcal{Q} , II.3
$\mathfrak{V}_{(\mathfrak{J}, \mathcal{W})}$	Neighborhood system for $L(\mathcal{N}, \mathcal{M})$, I.7
$(\mathfrak{H}(\mathcal{N}, \mathcal{M}), \mathfrak{V})$	Locally convex cone of linear operators from \mathcal{N} to \mathcal{M} , I.7
$P_w^{**}, P_s^{**}, P_{sr}^{**}, P_{sl}^{**}, P^{**}$	Second duals of a locally convex cone, I.7.3

Integral-Related Special Symbols

\mathfrak{R}	Weak σ -ring of subsets, II.1.1
$\mathfrak{A}_{\mathfrak{R}}$	σ -algebra of measurable subsets, II.1.1
χ_E	Characteristic function of a subset $E \subset X$, II.1.1
$\mathcal{S}_{\mathfrak{R}}(X, \mathcal{P})$	Cone of all \mathcal{P} -valued step functions supported by \mathfrak{R} , II.1.1
$\mathcal{E}_{\mathfrak{R}}(X, \mathcal{P})$	Subcone generated by all \mathcal{P} -valued elementary functions, II.6.16
$\mathcal{F}_{\mathfrak{R}}(X, \mathcal{P})$	A cone of measurable functions, II.2.3
$ \theta (E, v)$	The modulus of the measure θ , II.3.2
$\int_F f d\theta$	Integral of a function $f \in \mathcal{F}_{\mathfrak{R}}(X, \mathcal{P})$ over a set $F \in \mathfrak{A}_{\mathfrak{R}}$, II.4.9
$\int_F f d\theta$	Integral of a function $f \in \mathcal{F}(X, \mathcal{P})$ over a set $F \in \mathfrak{A}_{\mathfrak{R}}$, II.4.13
$\mathcal{F}_{(F, \theta)}(X, \mathcal{P})$	Functions in $\mathcal{F}(X, \mathcal{P})$ that are integrable over $F \in \mathfrak{A}_{\mathfrak{R}}$, II.4.13
$\mathcal{F}_{(F, \Theta)}(X, \mathcal{P})$	Functions integrable with respect to a family of measures, II.5.3
$\mathcal{F}_{(F , \Theta)}(X, \mathcal{P})$	Functions integrable with respect to a family of measures, II.5.3
$(\mathcal{F}_{(F, \Theta)}(X, \mathcal{P}), \mathfrak{V}(F, \Theta))$	Locally convex cone of integrable functions, II.5.5
$\mathfrak{R}\mathfrak{s}(\theta_n, F, f)$	Residual component of a function, II.5.16
$\mathfrak{var}(\theta_a, X)$	Variation of a real-valued measure, II.5.34
$\mathcal{Z}(A, E), \mathcal{I}(A, E)$	II.6.8

Order Relations

\leq	Standard order relation (reflexive, transitive and compatible with algebraic operations)
\preceq	(global) weak preorder, I.3
\preceq_v	local weak preorder (referring to a neighborhood $v \in \mathcal{V}$), I.3

\preceq	(global) preorder, I.8
\preceq_v	local preorder (referring to a neighborhood $v \in \mathcal{V}$), I.8
$\preceq_{a.e.F}$	Almost everywhere order relation for functions, II.4.11
\leq_P	Order relation for measures, II.5.11
$\overset{F}{\preceq}$	Order relation for measures, II.5.17

Operations on Elements

$\mathcal{B}(a), (a)\mathcal{B}, \mathcal{B}^s(a)$	Boundedness components of a , I.4.9
$\mathcal{B}_v(a), (a)\mathcal{B}_v, \mathcal{B}_v^s(a)$	Local boundedness components of a (referring to a neighborhood $v \in \mathcal{V}$), I.4
$\mathfrak{O}(a)$	Zero component of a , I.5.8
$\mathfrak{O}(a \searrow b)$	Zero component of a relative to b , I.5.16

Operations on Sets

$\downarrow A = \{x \in E \mid x \leq a \text{ for some } a \in A\}$	decreasing hull of a set $A \subset \mathcal{P}$, I.1.4
$\uparrow A = \{x \in E \mid x \geq a \text{ for some } a \in A\}$	increasing hull of a set $A \subset \mathcal{P}$,
$\text{conv}(A)$	Convex hull of a set $A \subset \mathcal{P}$, I.5.7
$\text{Ex}(A)$	Set of extreme points of a convex set $A \subset \mathcal{P}$, I.5.33
$\overline{A}, A^\circ, \partial A = \overline{A} \setminus A$	topological closure, interior and boundary of a set A
$\overline{A}^{(l)}$	Closure of A with respect to the lower relative topology, I.4.24
$\overline{A}^{(u)}$	Closure of A with respect to the upper relative topology, I.4.24
$v(A), (A)v$	upper and lower relative neighborhoods of a set $A \subset \mathcal{P}$, I.4.28

Convergence

$\varliminf_{i \in \mathcal{I}} a_i, \overline{\lim}_{i \in \mathcal{I}} a_i,$	Order convergence for a net $(a_i)_{i \in \mathcal{I}}$, I.5.18
$f_n \overset{v}{\underset{F}{\searrow}} f, f_n \overset{v}{\nearrow}_F f,$	Upper, lower and symmetric
$f_n \overset{v}{\xrightarrow{F}} f$	pointwise convergence for functions on a set F , II.1.7
$f_n \overset{a.e.F}{\searrow} f, f_n \nearrow_{a.e.F} f,$	Upper, lower and symmetric almost everywhere
$f_n \overset{a.e.F}{\xrightarrow{F}} f$	pointwise convergence for functions on a set F , II.5.22

$\theta_n \nearrow \theta,$	$\theta_n \searrow \theta,$	Upper, lower and symmetric
$\theta_n \longrightarrow \theta$		convergence of sequences of measures, II.5.13

Symbols Related to Continuous Cone-valued Functions

$\text{supp}(f) = \overline{\{x \in X \mid f(x) \neq 0\}}$	The support of a function, III.1
$\text{supp}^*(f) = \{x \in X \mid f(x) \neq 0\}$	The core support of a function, III.1
$\mathcal{C}^r(X, \mathcal{P})$	Cone of r-continuous \mathcal{P} -valued functions, III.1
$\varphi \otimes a$	Elementary function, III.1.10
\mathfrak{K}	Family of all compact subsets of X , III.2
\mathfrak{K}_0	Family of all both open and compact subsets of X , III.2
$\mathcal{K}(X)$	Continuous positive real-valued functions with support in \mathfrak{K} , III.2
$\mathcal{K}_0(X)$	Continuous positive real-valued functions with core support in \mathfrak{K}_0 , III.2
$\mathcal{E}(X, \mathcal{P}), \mathcal{E}_0(X, \mathcal{P})$	Cones generated by elementary functions, III.2.3
$\mathcal{F}_{\mathfrak{A}}(X, \mathcal{P}), \mathcal{F}_{\mathfrak{A}_0}(X, \mathcal{P})$	Closures of $\mathcal{E}(X, \mathcal{P})$ and $\mathcal{E}_0(X, \mathcal{P})$, III.2.4
$\mathcal{C}_{\mathfrak{A}}^r(X, \mathcal{P}), \mathcal{C}_{\mathfrak{A}_0}^r(X, \mathcal{P})$	The r-continuous functions in $\mathcal{F}_{\mathfrak{A}}(X, \mathcal{P})$, and $\mathcal{F}_{\mathfrak{A}_0}(X, \mathcal{P})$, III.2.5
$E \prec \varphi, \quad \varphi \prec E$	for $E \in \mathfrak{K}$ and $\varphi \in \mathcal{K}(X)$, III.4.5

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