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Notation Index

\mathbf{R}	set of real numbers
\mathcal{N}	set of nonnegative real numbers
ϕ	null or empty set
$\mathbf{x} = (x_i)$	the vector whose i^{th} component is x_i
$\mathbf{1}$	the sum vector containing all 1's
$\mathbf{0}$	the null vector/matrix containing all 0's
\mathbf{I}_n	identity matrix of order n
\mathbf{e}_i	i^{th} unit column vector
\mathbf{x}'	transpose of a vector
$\mathbf{x} \cdot \mathbf{y}$	scalar product of vectors \mathbf{x} , \mathbf{y}
$\ \cdot\ $	Euclidean norm
$\mathbf{x}/\ \mathbf{x}\ $	direction of vector \mathbf{x}
$\ \mathbf{x} - \mathbf{y}\ $	distance between points \mathbf{x} , \mathbf{y}
\mathbf{A}	an $(m \times n)$ matrix \mathbf{A}
$\rho(\mathbf{A})$	rank of a matrix \mathbf{A}
$ \mathbf{A} $	determinant of an n^{th} order matrix \mathbf{A}
$x \in \mathcal{Y}$	x is an element of a set \mathcal{Y}
$x \notin \mathcal{Y}$	x is not an element of a set \mathcal{Y}
$\mathcal{A} \subseteq \mathcal{B}$	set \mathcal{A} is a subset of set \mathcal{B} (possibly $\mathcal{A} = \mathcal{B}$)
$\mathcal{A} \subset \mathcal{B}$	set \mathcal{A} is a proper subset of set \mathcal{B}
$\mathcal{V}_n(\mathcal{F})$	n -dimensional vector space over field \mathcal{F}
$\mathcal{V}_n(\mathbf{R}) = \mathbf{R}^n$	n -space or the set of all real n -component vectors
$\dim(\mathcal{V})$	dimension of a vector space \mathcal{V}
\mathcal{M}	subspace or linear manifold
$\ell(\mathcal{M})$	linear hull of subspace \mathcal{M}
$\mathcal{M}_1 \oplus \mathcal{M}_2$	direct sum of subspaces $\mathcal{M}_1, \mathcal{M}_2$
\mathcal{M}^\perp	orthogonal complement or dual space of \mathcal{M}

$d(\mathcal{Y})$	diameter of a set \mathcal{Y}
$d(\mathbf{x}, \mathcal{Y})$	distance between vector \mathbf{x} and set \mathcal{Y}
$d(\mathcal{Y}, \mathcal{Z})$	distance between sets \mathcal{Y}, \mathcal{Z}
$B(\mathbf{x}_0, \delta)$	δ -neighborhood of a point $\mathbf{x}_0 \in \mathbf{R}^n$ (or an open ball or sphere of radius δ about \mathbf{x}_0)
\mathcal{C}	cone
\mathcal{C}^+	polar cone
\mathcal{C}^*	dual cone
(\mathbf{a})	ray or half-line
$(\mathbf{a})^\perp$	orthogonal cone to (\mathbf{a})
$(\mathbf{a})^+$	polar of (\mathbf{a})
$(\mathbf{a})^*$	dual of (\mathbf{a})
\mathcal{Y}°	interior of set \mathcal{Y}
\mathcal{Y}^c	complementary set of \mathcal{Y}
$\bar{\mathcal{Y}}$	closure of set \mathcal{Y}
$\partial(\mathcal{Y})$	boundary of set \mathcal{Y}
$\text{coni}(\mathcal{Y})$	conical hull of set \mathcal{Y}
$0^+(\mathcal{Y})$	recession cone of set \mathcal{Y}
$\text{aff}(\mathcal{Y})$	affine hull of set \mathcal{Y}
$\text{co}(\mathcal{Y})$	convex hull of set \mathcal{Y}
$\text{ri}(\mathcal{Y})$	relative interior of convex set \mathcal{Y}
$r\partial(\mathcal{Y})$	relative boundary of set \mathcal{Y}
$\mathcal{Y}_1 + \mathcal{Y}_2$	linear sum of convex sets $\mathcal{Y}_1, \mathcal{Y}_2$
$\text{cone}(\mathcal{Y})$	convex cone generated by \mathcal{Y}
$\text{ray}(\mathcal{Y})$	union of the origin and the set of recession half-lines
sup	supremum or least upper bound
inf	infimum or greatest lower bound
$\mathcal{A} \times \mathcal{B}$	Cartesian product of sets \mathcal{A}, \mathcal{B}
$[\mathbf{x}_1, \mathbf{x}_2]$	closed line segment joining points $\mathbf{x}_1, \mathbf{x}_2$

$\{\mathbf{x}_k\}$	sequence of points
$\{\mathbf{x}_{k_j}\}, j=1, 2,$	subsequence of points
$\{\mathbf{x}_k\}_{k \in \mathfrak{K}}$	subsequence of points, where \mathfrak{K} is a subset of positive integers
\mathfrak{H}	hyperplane
$[\mathfrak{H}^+], [\mathfrak{H}^-]$	closed half-planes
$(\mathfrak{H}^+), (\mathfrak{H}^-)$	open half-planes
σ^k	k -dimensional simplex
$a \equiv b \pmod{m}$	$a - b$ is divisible by m
$f: \mathfrak{Y}_1 \rightarrow \mathfrak{Y}_2$	point-to-point mapping from \mathfrak{Y}_1 to \mathfrak{Y}_2
$f \circ g$	composition of f with g
\mathfrak{D}_f	domain of f
\mathfrak{R}_f	range of f
\mathfrak{G}_f	graph of f
f^{-1}	single-valued inverse mapping
$2^{\mathfrak{Y}}$	power set of \mathfrak{Y}
$F: \mathfrak{Y}_1 \rightarrow \mathfrak{Y}_2$	point-to-set mapping from \mathfrak{Y}_1 to \mathfrak{Y}_2
F^{-1}	inverse point-to-set mapping
$F(\mathbf{x})$	image set of \mathbf{x}
$F^{+1}(\mathfrak{B})$	upper inverse image of \mathfrak{B} under F
$F^{-1}(\mathfrak{B})$	lower inverse image of \mathfrak{B} under F
$G \circ F$	composition correspondence
$F \cap G$	intersection correspondence
$F \times G$	product correspondence
$F + G$	sum correspondence

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