Index of Notations

Structures of Spaces

Categories

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$\mathcal{T}$: metrizable topological spaces and continuous functions, page 2

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<u>Subsets of the real numbers</u>

$\frac{1}{2}D$ = $\{0,\frac{1}{2}\}$, page 135

D = $\{0,1\}$, page 8

D_m = $\{1/n_1 + \ldots + 1/n_s$: for $1 \leq i \leq s \leq m$, n_i is a whole number$\} \cup \{0\}$, page 33

E = $\{1/3^n$: n is an integer$\} \cup \{0\}$, page 113

G = an arbitrary additive subgroup of the real numbers, page 58

H = $\{1/n$: n is a whole number$\} \cup \{0\}$, page 33

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$\mathbb{P}$ = the irrational numbers, page 32

$\mathbb{P}^+$ = $\{\mathbb{P} \cap [0,\infty)\} \cup \{0\}$, page 32

$\mathbb{Q}$ = the rational numbers, page 32

$\mathbb{Q}^+$ = $\mathbb{Q} \cap [0,\infty)$, page 32

$\mathbb{R}$ = the real numbers, page 1

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S and T stand for arbitrary subsets of $\mathbb{R}$, page 2

W = $\{1/3^n$: n is a whole number$\} \cup \{0\}$, page 36

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$\mathbb{Z}$ = $\{0, \pm 1, \pm 2, \ldots\}$, page 56

$\mathbb{Z}^+$ = $\{0, 1, 2, \ldots\}$, page 56

Families of subsets of the real numbers

$\mathcal{H}$: subsets of the positive reals which include 0 , page 5

$\mathcal{J}$: non empty subsets of the real numbers, page 2

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$\mathcal{Z}$: closed subgroups of $\mathbb{R}$, page 59

Properties of structure generating functions

Functions of two variables (page 93 and page 105)

1. $d(x,y) \geq 0$ for all x and y, $d(x,x) = 0$ for all x,
2. if $d(x,y) = 0$ then $x = y$,
3. $d(x,y) = d(y,x)$ for all x and y,
4. $d(x,y) \leq d(x,z) + d(z,y)$ for all x, y, and z,
5. $d(x,y) \leq \max\{d(x,z), d(z,y)\}$ for all x, y, and z,
6. $d(x+a, y+a) = d(x,y)$ for all x, y, and a.

$\mathcal{P}_1 = \{1,2,3,5\}$

$\mathcal{P}_2 = \{1,2,3,4\}$

$\mathcal{P}_3 = \{1,2,3\}$

$\mathcal{P}_4 = \{1,2\}$

$\mathcal{P}_5 = \{1,2,4\}$

$\mathcal{P}_6 = \{1,2,3,4,6\}$

$\mathcal{P}_{10} = \{1,3,5\}$

$\mathcal{P}_{20} = \{1,3,4\}$

$\mathcal{P}_{30} = \{1,3\}$

$\mathcal{P}_{40} = \{1\}$

$\mathcal{P}_{50} = \{1,4\}$

Functions of one variable (page 109 and page 141)

1. $f(x) = 0$ if and only if $x = 0$,
2. $f(x) = f(-x)$ for all x ,
3. $f(x+y) \leq f(x) + f(y)$ for all x and y ,
4. $f(x+y) \leq \max\{f(x), f(y)\}$ for all x and y ,
5. $f(x.y) \leq \min\{f(x), f(y)\}$ for all x and y ,
6. $f(x.y) \leq f(x).f(y)$ for all x and y ,
7. $f(x.y) = f(x).f(y)$ for all x and y ,
8. if $a \to 0$ in $\mathbb{K}$ and $x \in V$ then $f(ax) \to 0$ in $\mathbb{R}$,
9. if $a \in \mathbb{K}$ and $|a| \leq 1$ then $f(ax) \leq f(x)$ for all x .

$\mathcal{P}_{21} = \{1,2,3,5\}$ $\mathcal{P}_{22} = \{1,2,3,6\}$

$\mathcal{P}_{23} = \{1,2,4,5\}$ $\mathcal{P}_{24} = \{1,2,4,6\}$

$\mathcal{P}_{31} = \{1,2,3,7\}$ $\mathcal{P}_{32} = \{1,2,4,7\}$

$\mathcal{P}_{41} = \{1,2,3,8,9\}$

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