Test Knowledge

Sections 2.1–2.5, 8.1

Definitions   Open set in $\mathbf{R}$ (2.1.1)
Topological space (2.2.1)
Topological spaces $(\mathbf{R}, \mathcal{U})$, $(\mathbf{R}, \mathcal{H})$, $(\mathbf{R}, \mathcal{C})$
Discrete (2.2.4), indiscrete (2.2.5) topologies
Particular point (2.2.6), finite complement (2.2.8) topologies
Continuous function (2.2.13)
Closed set (2.3.1), closure of a set $\operatorname{Cl} A$ (2.3.10)
Dense set (2.3.19)
Limit point, set of limit points A' (2.4.1)
Interior $\operatorname{Int} A$ (2.4.11), exterior $\operatorname{Ext} A$ (2.4.17), boundary $\operatorname{Bd} A$ (2.4.20)
Base for a topology (2.5.1)
Metric (8.1.1)
The discrete metric (8.1.3), the three metrics on $\mathbf{R}^n$ (8.1.4)
Open ball (8.1.5)
Metric topology (8.1.8)

Theorems   Theorem 2.1.5
Theorems 2.3.7, 2.3.8, 2.3.15, 2.3.17
Theorems 2.4.7 & 2.4.9
Theorems 2.4.14, 2.4.21 and $(\operatorname{Cl} A)^c = \operatorname{Int}(A^c)$
Theorems 2.5.6 & 2.5.7
Theorems 8.1.7 & 8.1.9

Proofs   Theorem 2.1.5
Theorem 2.5.6
Theorem 2.5.7
Theorem 8.1.7

Sections 3.1-3.4, 4.1, 4.2, 4.4

Definitions   Relative topology (3.1.1)
Cl, Int, Bd in the relative topology
Neighborhood of a point (3.2.2)
Open function (3.3.1)
Homeomorphism (3.3.5)
Topology on $\mathbf{R}^n$ (3.4)
Product topology on two and finitely many sets (4.1.2, 4.2.2)

Theorems   Theorem 3.1.7, 3.1.13
Theorem 3.1.8
Theorem 3.2.9
Theorems 3.2.13 & 3.2.14, problem 3.2.12
Theorems 3.3.6 & 3.3.7
Theorems 3.3.15, 3.3.16 and 3.3.17
Theorems 4.1.8 & 4.2.3
Theorems 4.1.9 & 4.1.11
Theorem 4.1.10
Lemmas 4.2.8 & 4.2.9
Theorems 4.2.11 & 4.2.13
Continuity of a, m, i_a, i_m in the usual topology

Proofs   Theorem 4.1.9
Lemmas 4.2.8 & 4.2.9
Theorem 4.2.13
Continuity of a, m, i_a, i_m in the usual topology

Sections 5.1–5.3, 6.1, 6.2

Definitions   Connected, disconnected space (5.1.1)
Upper, lower bound, least upper bound (supremum),
    greatest lower bound (infimum) (5.1.7)
Fixed point of a function, fixed point property (5.2.14))
Cut point (5.2.18)
Cover, open cover of a set (6.1.1)
Compact space, subset (6.1.6)
Hausdorff space (6.1.14)
Bounded function (6.2.4)
Finite intersection property (6.2.14)

Theorems   Completeness property of **R** (5.1.8)
Theorem 5.1.11
Theorem 5.1.12
Theorem 5.2.1
Theorems 5.2.4, 5.2.6, 5.2.8, 5.2.9
Theorem 5.2.11
Theorems 5.2.15, 5.2.17, 5.2.22
Theorem on connectedness of a union of connected sets
    with a common point (notes)
Lemma 5.3.1
Theorems 5.3.3, 5.3.4
Theorem 6.1.12
Theorems 6.1.13, 6.1.19, 6.1.20, 6.1.21
Theorems 6.2.1, 6.2.2, 6.2.3
Theorems 6.2.5, 6.2.7
Theorems 6.2.11, 6.2.12
Theorem 6.2.16

Proofs   Theorem 5.2.11
Theorem 5.2.17
Theorem 5.3.3
Theorem 6.1.21