

Convex Analysis And Monotone Operator Theory In Hilbert Spaces

[DOWNLOAD HERE](#)

1;Foreword;8 2;Preface;10 3;Contents;12 4;Chapter 1: Background;18 4.1;1.1 Sets in Vector Spaces;18 4.2;1.2 Operators;19 4.3;1.3 Order;20 4.4;1.4 Nets;21 4.5;1.5 The Extended Real Line;21 4.6;1.6 Functions;22 4.7;1.7 Topological Spaces;24 4.8;1.8 Two Point Compactification of the Real Line;26 4.9;1.9 Continuity;26 4.10;1.10 Lower Semicontinuity;27 4.11;1.11 Sequential Topological Notions;32 4.12;1.12 Metric Spaces;33 4.13;Exercises;39 5;Chapter 2: Hilbert Spaces;43 5.1;2.1 Notation and Examples;43 5.2;2.2 Basic Identities and Inequalities;45 5.3;2.3 Linear Operators and Functionals;47 5.4;2.4 Strong and Weak Topologies;49 5.5;2.5 Weak Convergence of Sequences;52 5.6;2.6 Differentiability;53 5.7;Exercises;56 6;Chapter 3: Convex Sets;59 6.1;3.1 Definition and Examples;59 6.2;3.2 Best Approximation Properties;60 6.3;3.3 Topological Properties;68 6.4;3.4 Separation;71 6.5;Exercises;73 7;Chapter 4: Convexity and Nonexpansiveness;75 7.1;4.1 Nonexpansive Operators;75 7.2;4.2 Projectors onto Convex Sets;77 7.3;4.3 Fixed Points of Nonexpansive Operators;78 7.4;4.4 Averaged Nonexpansive Operators;83 7.5;4.5 Common Fixed Points;87 7.6;Exercises;88 8;Chapter 5: Fejr Monotonicity and Fixed Point Iterations;91 8.1;5.1 Fejr Monotone Sequences;91 8.2;5.2 Krasnosel'skii Mann Iteration;94 8.3;5.3 Iterating Compositions of Averaged Operators;98 8.4;Exercises;101 9;Chapter 6: Convex Cones and Generalized Interiors;103 9.1;6.1 Convex Cones;103 9.2;6.2 Generalized Interiors;106 9.3;6.3 Polar and Dual Cones;112 9.4;6.4 Tangent and Normal Cones;116 9.5;6.5 Recession and Barrier Cones;119 9.6;Exercises;120 10;Chapter 7: Support Functions and Polar Sets;123 10.1;7.1 Support Points;123 10.2;7.2 Support Functions;125 10.3;7.3 Polar Sets;126 10.4;Exercises;127 11;Chapter 8: Convex Functions;129 11.1;8.1 Definition and Examples;129 11.2;8.2 Convexity Preserving Operations;132 11.3;8.3 Topological Properties;136 11.4;Exercises;141 12;Chapter 9: Lower Semicontinuous Convex Functions;144 12.1;9.1 Lower Semicontinuous Convex Functions;144 12.2;9.2 Proper Lower Semicontinuous Convex Functions;147 12.3;9.3 Affine Minorization;148 12.4;9.4 Construction of Functions in $\cdot_0(H)$;151 12.5;Exercises;156 13;Chapter 10: Convex Functions: Variants;157 13.1;10.1 Between Linearity and Convexity;157 13.2;10.2 Uniform and Strong

Convexity;158 13.3;10.3 Quasiconvexity;162 13.4;Exercises;165 14;Chapter 11: Convex Variational Problems;168 14.1;11.1 Infima and Suprema;168 14.2;11.2 Minimizers;169 14.3;11.3 Uniqueness of Minimizers;170 14.4;11.4 Existence of Minimizers;170 14.5;11.5 Minimizing Sequences;173 14.6;Exercises;177 15;Chapter 12: Infimal Convolution;179 15.1;12.1 Definition and Basic Facts;179 15.2;12.2 Infimal Convolution of Convex Functions;182 15.3;12.3 Pasch Hausdorff Envelope;184 15.4;12.4 Moreau Envelope;185 15.5;12.5 Infimal Postcomposition;190 15.6;Exercises;190 16;Chapter 13: Conjugation;193 16.1;13.1 Definition and Examples;193 16.2;13.2 Basic Properties;196 16.3;13.3 The Fenchel Moreau Theorem;202 16.4;Exercises;206 17;Chapter 14: Further Conjugation Results;208 17.1;14.1 Moreau s Decomposition;208 17.2;14.2 Proximal Average;210 17.3;14.3 Positively Homogeneous Functions;212 17.4;14.4 Coercivity;213 17.5;14.5 The Conjugate of the Difference;215 17.6;Exercises;216 18;Chapter 15: Fenchel Rockafellar Duality;218 18.1;15.1 The Attouch Brzis Theorem;218 18.2;15.2 Fenchel Duality;222 18.3;15.3 Fenchel Rockafellar Duality;224 18.4;15.4 A Conjugation Result;228 18.5;15.5 Applications;229 18.6;Exercises;231 19;Chapter 16: Subdifferentiability;234 19.1;16.1 Basic Properties;234 19.2;16.2 Convex Functions;238 19.3;16.3 Lower Semicontinuous Convex Functions;240 19.4;16.4 Subdifferential Calculus;244 19.5;Exercises;251 20;Chapter 17: Differentiability of Convex Functions;252 20.1;17.1 Directional Derivatives;252 20.2;17.2 Characterizations of Convexity;25 EAN/ISBN : 9781441994677 Publisher(s): Springer, Berlin, Springer Science & Business Media Format: ePub/PDF Author(s): Bauschke, Heinz H. - Combettes, Patrick L.

[DOWNLOAD HERE](#)

Similar manuals: