Chapter 1 : Teichmüller Theory and Applications

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Hyperbolization of Haken Manifolds not yet published From the introduction by the author: Volumes 2 through 4 prove four theorems by William Thurston: The classification of homeomorphisms of surfaces The topological characterization of rational maps The hyperbolization theorem for 3-manifolds that fiber over the circle The hyperbolization theorem for Haken 3-manifolds These theorems are of extraordinary beauty in themselves, and the methods Thurston used to prove them were so novel and displayed such amazing geometric insight that to this day they have barely entered the accepted methods of mathematicians in the field. The results sound more or less unrelated, but they are linked by a common thread: Each says that either a topological problem has a natural geometry, or there is an understandable obstruction. The proofs are closely related: Thurston proceeds to show that if there is no fixed point, then some system of simple closed curves is an obstruction to finding a solution. These theorems have been quite difficult to approach, in part because Thurston never published complete proofs of any of them. In this second volume, in Chapters 8 and 10, I prove the first two of these theorems. Both proofs use most of the contents of Volume 1. Chapters 8 and 10 also contain an extensive collection of examples. In Chapter 8 we exhibit some constructions of pseudo-Anosov mappings; Chapter 10 describes spiders and uses them to analyze the structure of the Mandelbrot set. This requires the basics of dynamics in one complex variable; Chapter 9 contains the necessary material. There are nine appendices. The first proves the Perron-Frobenius theorem; the next three treat some technical issues concerning the topology of surfaces and their homeomorphisms: Appendix C6 gives a bare bones treatment of irrationally indifferent fixed points to complete the cases treated in Chapter 9. Appendices C7 and C8 are relevant to Chapter Appendix C7 gives some examples of Thurston pullback maps. Appendix C8completes the main theorem by an analysis of postcritically finite branched maps with nonhyperbolic orbifolds. Several topics are relevant to this volume, but the appendix is really about the relations of these topics to those that will be treated in Volumes 3 and 4.

Chapter 2 : Gottschalk : Minimal sets: An introduction to topological dynamics

The theory of differential equations originated at the end of the seventeenth century in the works of I. Newton, G. W. Leibniz and others. During the first century of its existence, this theory consisted only of isolated methods of solving certain types of differential equations; but the problem of.

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Chapter 5 : Topological dynamics - Wikipedia

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The reader should be aware that Ellis uses right rather than left actions and so his semigroup structure on ï¬,T is the reverse of mine. His left trans-lations are continuous and his compatibility equation reads (xq)p = x(qp).

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An introduction to topologica!, dynamics If M is a metric space with a distance d, the poin Gt x M is said to b asymptotically e periodÃ¬c if there is a periodic point y e M for which.

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topological in nature, whose prototype occurred in classical dynamics. Henri PoincarÃ© was the first to introduce topological notions and methods in dynamics, that is, the study of ordinary differential equaÂ.