

REFERENCES

- Agard, S.: [1] Angles and quasiconformal mappings in space, *J. Analyse Math.* 22 (1969), 177-200.
- Ahlfors, L.: [1] On quasiconformal mappings, *J. Analyse Math.* 3 (1954), 1-58. - [2] Extension of quasiconformal mappings from two to three dimensions, *Proc. Nat. Acad. Sci. USA* 51 (1964), 768-771. - [3] Lectures on quasiconformal mappings, Van Nostrand, 1966.
- Ahlfors, L. and A. Beurling: [1] Conformal invariants and function-theoretic null-sets, *Acta Math.* 83 (1950), 101-129.
- Beurling, A. and L. Ahlfors: [1] The boundary correspondence under quasiconformal mappings, *Acta Math.* 96 (1956), 125-142.
- Brown, M.: [1] A proof of the generalized Schoenflies theorem, *Pull. Amer. Math. Soc.* 66 (1960), 74-76.
- Caraman, F.: [1] Homeomorfisme cvasiconforme n-dimensionale, Bucharest, 1968.
- Fuglede, P.: [1] Extremal length and functional completion, *Acta Math.* 98 (1957), 171-219.
- Gehring, F. W.: [1] The definitions and exceptional sets for quasiconformal mappings, *Ann. Acad. Sci. Fenn. A I* 281 (1960), 1-28. - [2] Symmetrization of rings in space, *Trans. Amer. Math. Soc.* 101 (1961), 499-519. - [3] Rings and quasiconformal mappings in space, *Trans. Amer. Math. Soc.* 103 (1962), 353-393. - [4] Extremal length definitions for the conformal capacity of rings in space, *Michigan Math. J.* 9 (1962), 137-150. - [5] The Carathéodory convergence theorem for quasiconformal mappings in space, *Ann. Acad. Sci. Fenn. A I* 336/11 (1963), 1-21. - [6] Extension theorems for quasiconformal mappings in n-space, *J. Analyse Math.* 19 (1967), 149-169. - [7] Extremal mappings between tori, to appear.
- Gehring, F. W. and J. Väisälä: [1] On the geometric definition for quasiconformal mappings, *Comment. Math. Helv.* 36 (1961), 19-32. - [2] The coefficients of quasiconformality of domains in space, *Acta Math.* 114 (1965), 1-70.
- Graves, L. M.: [1] The theory of functions of real variables, McGraw-Hill, 1946.
- Gross, W.: [1] Über das Flächenmass von Punktmengen, *Monatsh. Math.* 29 (1918), 145-176.
- Grötzsch, H.: [1] Über die Verzerrung bei schlichten nichtkonformen

- Abbildungen und über eine damit zusammenhängende Erweiterung des Picardschen Satzes, *Verh. Sächs. Akad. Wiss. Leipzig* 80 (1928), 503-507.
- Hardy, G. H., J. E. Littlewood, and G. Pólya: [1] *Inequalities*, Cambridge University Press, 1934.
- Hartman, P.: [1] On isometries and on a theorem of Liouville, *Math. Z.* 69 (1958), 202-210.
- Hocking, J. G. and G. S. Young: [1] *Topology*, Addison-Wesley, 1961.
- Hurewicz, V. and H. Wallman: [1] *Dimension theory*, Princeton University Press, 1941.
- Kreines, M.: [1] Sur une classe de fonctions de plusieurs variables, *Mat. Sbornik* 9 (1941), 713-719.
- Lavrentiev, M.: [1] Sur un critère différentiel des transformations homéomorphes des domaines à trois dimensions, *Dokl Akad. Nauk SSSR* 22 (1938), 241-242.
- Lehto, O. and K. I. Virtanen: [1] *Quasikonforme Abbildungen*, Springer-Verlag, 1965.
- Liouville, J.: [1] Extension au cas des trois dimensions de la question du tracé géographique, Application de l'analyse à la géométrie, G. Monge, Paris, 1850, 609-616.
- Loewner, C.: [1] On the conformal capacity in space, *J. Math. Mech.* 8 (1959), 411-414.
- Markuševič, A.: [1] Sur certaines classes de transformations continues, *Dokl. Akad. Nauk SSSR* 28 (1940), 301-304.
- Mazur, B.: [1] On embeddings of spheres, *Full. Amer. Math. Soc.* 65 (1959), 59-65.
- Mori, A.: [1] On quasi-conformality and pseudo-analyticity, *Trans. Amer. Math. Soc.* 84 (1957), 56-77.
- Morse, M.: [1] Differentiable mappings in the Schoenflies theorem, *Compositio Math.* 14 (1960), 83-151. - [2] A reduction of the Schoenflies extension problem, *Full. Amer. Math. Soc.* 66 (1960), 113-115.
- Mostow, G. D.: [1] Quasi-conformal mappings in n -space and the rigidity of hyperbolic space forms, *Inst. Hautes Études Sci. Publ. Math.* 34 (1968), 53-104.
- Munroe, M. E.: [1] *Introduction to measure and integration*, Addison-Wesley, 1953.
- Näkki, R.: [1] Boundary behavior of quasiconformal mappings in n -space, *Ann. Acad. Sci. Fenn. A I* 484 (1970), 1-50.
- Nevanlinna, R.: [1] On differentiable mappings, *Analytic functions*, edited by L. Ahlfors et al., Princeton University Press, 1960, 3-9.

- Newman, M. H. A.: [1] Elements of the topology of plane sets of points, Cambridge University Press, 1961.
- Pfluger, A.: [1] Über die Äquivalenz der geometrischen und der analytischen Definition quasikonformer Abbildungen, Comment. Math. Helv. 33 (1959), 23-33.
- Rešetnjak, Ju. G.: [1] Some geometrical properties of functions and mappings with generalized derivatives (Russian), Sibirsk. Mat. Ž. 7 (1966), 886-919. - [2] On the stability of conformal mappings in multidimensional spaces (Russian), Sibirsk. Mat. Ž. 8 (1967), 91-114. - [3] Mappings with bounded distortion as extremal integrals of Dirichlet type (Russian), Sibirsk. Mat. Ž. 9 (1968), 652-666.
- Saks, S.: [1] Theory of the integral, Warsaw, 1937.
- Sard, A.: [1] The equivalence of n -measure and Lebesgue measure in E_n , Bull. Amer. Math. Soc. 49 (1943), 758-759.
- Smirnov, V. I.: [1] Lehrgang der höheren Mathematik, Teil V, Berlin, 1962.
- Stepanov, V.: [1] Sur les conditions de l'existence de la différentielle totale, Mat. Sbornik 32 (1925), 511-527.
- Strebel, K.: [1] On the maximal dilation of quasiconformal mappings, Proc. Amer. Math. Soc. 6 (1955), 903-909.
- Syčev, A. V.: [1] Quasiconformal mappings in space (Russian), Dokl. Akad. Nauk. SSSR 166 (1966), 298-300.
- Väisälä, J.: [1] On quasiconformal mappings in space, Ann. Acad. Sci. Fenn. A I 298 (1961), 1-36. - [2] On quasiconformal mappings of a ball, Ann. Acad. Sci. Fenn. A I 304 (1961), 1-7. - [3] Two new characterizations for quasiconformality, Ann. Acad. Sci. Fenn. A I 362 (1965), 1-12. - [4] Removable sets for quasiconformal mappings, J. Math. Mech. 19 (1969), 49-51.
- Vamanamurthy, M. K.: [1] Quasiconformal mappings in space, University of Michigan dissertation, 1969.
- Wilder, R. L.: [1] Topology of manifolds, Amer. Math. Soc. Colloquium Series 32, 1949.
- Ziemer, W. F.: [1] Extremal length and conformal capacity, Trans. Amer. Math. Soc. 126 (1967), 460-473.
- Zorič, V. A.: [1] Correspondence of the boundaries in Q -quasiconformal mappings of a sphere (Russian), Dokl. Akad. Nauk SSSR 145 (1962), 1209-1212. - [2] Determination of boundary elements by means of sections (Russian), Dokl. Akad. Nauk SSSR 164 (1965), 736-739.

INDEX

A list of special symbols is given on pages X-XI.

- absolute continuity on a path 11
- absolutely continuous set
 - function 81
- ACL-mapping 88,107
- ACLⁿ-mapping 89,111,116
- almost every curve 17
- analytic definition 114,115,117
- arc 6,24
- Ascoli's theorem 68
- ball neighborhood VIII
- Borel function IX
- Borel set IX
- boundary extension 51-63,120
- change of parameter 4
- closed path 1,21
- cluster set 59
- coefficient of q_{cty} 127
- collared boundary 63,135
- condition (N) 85,112
- cone 50,135
- conformal mapping 13,25
- convergent sequences 69-77,123-126
- convolution 89
- c-uniform convergence 68
- curve 10
- curvilinear wedge 134
- cylinder 21,118
- cylinder, infinite 50,135
- cylindrical coordinates 49
- density theorem 83
- derivative of a mapping VIII
- derivative of a set function 82
- diffeomorphism 46
- differentiability VIII,97,109
- dilatation 42,43
- distortion 63-65
- equicontinuity 65-67
- exceptional set 52,62,118
- extremal mapping 127
- finitely connected 53
- folding 49,134
- Fuglede's theorem 95
- Hausdorff measure 99
- Hölder continuity 65
- infinite cylinder 50,135
- inner dilatation 42,43
- inverse of a path 5
- isolated singularity 52
- join 21,23
- Jordan domain 60,135
- kernel 73,129
- Lebesgue's theorem 82
- length function 2
- length of a path 1
- line integral 8
- linear dilatation 43,78,113
- Liouville's theorem V,15,43
- locally connected 53
- locally q_{clly} bi-collared 120
- locally q_{clly} collared 54
- locally rectifiable path 7
- maximal dilatation 42
- metric definition 113
- minorize 17
- Möbius transformation 14
- modulus 16
- modulus on a manifold 28
- (N), condition 85,112
- neighborhood VIII
- normal family 67-69
- normal representation 5
- open path 1,7,23
- outer dilatation 42,43
- parameter of regularity 82

partial derivative 86
path 1,7
point of density 83
projection 51
property P_1 53
property P_2 54
quasiconformal = qc 42
qcly collared boundary 63,135
qcly equivalent domains 43
quasiregular mapping VI
Rademacher-Stepanov theorem 97
radial mapping 49
raylike domain 130
rectifiable path 1
reflection principle 119
removable singularity 52,62,118
ring 32
ring definition 121
separate curve families 17
set function 81
smoothing 89
spherical coordinates 50
spherical distance 37
spherical isometry 38
spherical ring 22,131
stereographic projection 37
subpath 1
support 89
symmetrization VI, 26
volume derivative 83
wedge 49,132-135
wedge point 132