

Bibliography

- [1] Ahlfors, Lars V. Complex analysis. An introduction to the theory of analytic functions of one complex variable. Third edition. International Series in Pure and Applied Mathematics. McGraw-Hill Book Co., New York, 1978. xi+331 pp.
- [2] Dym, H.; McKean, H. P. Fourier series and integrals. Probability and Mathematical Statistics, No. 14. Academic Press, New York-London, 1972. x+295 pp.
- [3] Halmos, Paul R. Measure Theory. D. Van Nostrand Company, Inc., New York, N. Y., 1950. xi+304 pp.
- [4] Kolmogorov, A. N. Foundations of the theory of probability. Translation edited by Nathan Morrison, with an added bibliography by A. T. Bharuch-Reid. Chelsea Publishing Co., New York, 1956. viii+84 pp.
- [5] Parthasarathy, K. R. An introduction to quantum stochastic calculus. Monographs in Mathematics, 85. Birkhuser Verlag, Basel, 1992. xii+290 pp.
- [6] Parthasarathy, K. R. Probability measures on metric spaces. Probability and Mathematical Statistics, No. 3 Academic Press, Inc., New York-London 1967 xi+276 pp.
- [7] Royden, H. L. Real analysis. Third edition. Macmillan Publishing Company, New York, 1988. xx+444 pp.
- [8] Stroock, Daniel W.; Varadhan, S. R. Srinivasa Multidimensional diffusion processes. Grundlehren der Mathematischen Wissenschaften [Fundamental Principles of Mathematical Sciences], 233. Springer-Verlag, Berlin-New York, 1979. xii+338 pp.

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