

Themen für Proseminar “Funktionen und Folgen”, SS 2011

1. Fibonacci-Zahlen und verschiedene Anwendungen [5], [45]
2. Zerlegung von Rechtecken in verschiedene Quadrate [40], [9], [15]
3. Fundamentalsatz der Algebra – verschiedene Beweise [47], [32]
4. Differenzgleichungen (Rekursionsgleichungen) [4], [7], [14], [35]
5. Distributionen und Differentialrechnung von Distributionen. [21], [33], [38], [28]
6. Fraktionale Infinitesimalrechnung (fraktionale Ableitungen und Integration) und Anwendungen. [24], [36]
7. Spezielle Funktionen (Beta- und Gamma-Funktionen, Bessel-Funktionen) und Anwendungen [1], [2], [3], [6]
8. Orthogonale Polynome (Chebyshev-, Legendre-, Hermite-, Laguerre-Polynome) [1, Kapitel 22], [11], [27], [43]
9. Fourierreihe, Fourier-Transformation und Anwendungen zu Differentialgleichungen [27], [31], [33], [42]
10. Satz von Stone-Weierstraß und Anwendungen [37], [38], [17]
11. Hyperkomplexe Zahlen: Quaternionen und Oktonionen [12], [29]
12. Das Spernersche Lemma und Anwendungen (Fixpunktsatz von Brouwer, Lebesgue’sche Überdeckungsdimension) [17, Ch.11], [19]
13. Fixpunktsatz von Schauder und Anwendungen [22], [17, Ch.11]
14. Isoperimetrische Ungleichungen [10], [44]
15. Hausdorff-Maß und Hausdorff-Dimension [18, Ch. 2,3], [34]
16. Nichtstandardanalysis [17], [30], [23], [26]
17. Fréchet und Gâteaux Ableitungen: Rechenregel und Anwendungen in Variationsrechnung. [16], [13], [20]
18. Satz von Sard [8, p. 138-145], [25]
19. Satz von Baire (bairescher Kategoriensatz) und Anwendungen [41], [39], [46]

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