

Math. Physics (III)

- Gamma functions (factorial function), Euler's definite integral, Euler-Gauss formula, Weierstrass formula
 - Euler's reflection formula, Complex integral representation of gamma function, Digamma and Polygamma functions, Beta function
 - Solving Bessel's differential equation using the Frobenius method, Bessel functions of the first kind, Generating function
 - Recurrence relations, Integral representation for the Bessel functions of the first kind, Complex integral representation of the Bessel functions of the first kind
 - Orthogonality of the Bessel functions of the first kind, Bessel-Fourier series, Bessel functions of the second kind, Neumann function, Recurrence relations
 - Hankel functions, Spherical Bessel functions and the recurrence relations
 - Modified Bessel's differential equation, Modified Bessel functions of the first kind, Series form, Recurrence relations
 - Modified Bessel functions of the second kind and the recurrence relations, Legendre differential equation, Solving Legendre differential equation using the Frobenius method
 - Series form of the Legendre polynomials (Legendre functions of the first kind), Rodrigues' formula, Generating function and the recurrence relations, Orthogonality of Legendre polynomials
 - Legendre series, Generalized Legendre differential equation, Associated Legendre functions and their orthogonality relation
 - Spherical harmonics, Legendre functions of the second kind, Hermite differential equation, Hermite polynomials
 - Generating function for Hermite polynomials and the recurrence relations, Orthogonality of Hermite polynomials, Rodrigues' formula, Laguerre differential equation, Laguerre polynomials
 - Generating function for Laguerre polynomials and the recurrence relations, Rodrigues' formula, Associated Laguerre functions and the recurrence relations
 - Chebyshev polynomials of the first kind and of the second kind and the recurrence relations
 - Integral equations of the first kind
 - Integral equations of the second kind
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