

Abstract form

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Title of talk: On a Certain Class of Two-place Functional Equations

Abstract: Only during the last five decades, a certain class of two-place functional equations pops up normally from modelling many real world systems such as the switch which is a basic element of communication. Such a class nowadays has applications in wireless three-hop networks. Basically, this particular class stems naturally from modelling two-queue queueing systems. It takes the general form

$$P(x, y) = \frac{A(x, y)P(x, 0) + B(x, y)P(0, y) + C(x, y)P(0, 0) + D(x, y)}{H(x, y)}$$

where the functions A, B, C, D , and H are known polynomials of different degrees in two complex variables x and y . There are no general solution methodology available to such class, even exact form solutions to such equations are rarely reachable. In this talk I will start by showing in brief the relation between queueing systems and this class of functional equations. Afterwards I will show some survey surveying all the systems from which such class arises. In the end I will present a solution of a special case of such general class. This special equation arises from a network gateway modelled as two-back-to-back interfering queues. The solution is obtained by the reduction to Riemann-Hilbert boundary value problem.