

1023-60-1863

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Gambler's Ruin with Catastrophes and Windfalls.

Recursive approaches are used to compute ruin probabilities, in both infinite-time and finite-time, for a Gambler's Ruin problem with both catastrophes and windfalls in addition to the customary win/loss probabilities. For constant transition probabilities, the infinite-time ruin probabilities are derived using difference equations. Finite-time ruin probabilities of a system having constant win/loss probabilities and variable catastrophe/windfall probabilities are determined using lattice path combinatorics. Formulae for expected time till ruin and the expected duration of gambling are also developed. The infinite-time ruin probabilities of a system with variable win/loss/catastrophe/windfall probabilities are determined. (Received September 27, 2006)