

A Central Limit Theorem for integer partitions

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Given a monotone increasing sequence λ_k of positive integers, let ω_n be the length of a random partition of a positive integer n into distinct members of the sequence λ_k . It is known that for sequences λ_k satisfying certain technical conditions, the limit distribution of ω_n is Gaussian. We show that this is also true for the case of primes, i.e, λ_k is set to be the k th prime number, for which those conditions are not fully satisfied. We will discuss how the result can be generalised to sequences of the form $\lambda_k = f(p_k)$ where p_k is the k th prime number and $f(x)$ is a polynomial having integer values at integers. This includes powers of primes.