

1 Plane partition asymptotics

Let $p(n)$ be the number of plane partitions of n . MacMahon (1916) showed that

$$\sum_n p(n)q^n = \prod_n \left(\frac{1}{1-q^n} \right)^n$$

The asymptotics of this series are known:

$$p(n) \sim cn^{-25/36} \exp(Cn^{2/3})$$

where c, C are explicit constants (Wright 1931, Mutafchiev-Kamenov 2005 corrected an error in c). There are some other results for other enumerations of plane partitions; see Panario-Richmond-Y. 2010 and its bibliography.

Question: Is $n^{-25/36}$ universal amongst boundaryless, volume-constrained tiling problems? Amongst a broader class of random surface problems?