ASYMPTOTIC FORMULAS AND GENERALIZED DEDEKIND SUMS

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ABSTRACT. We find asymptotic formulas as $n \to \infty$ for the coefficients $a(r,n)$ defined by

$$\prod_{\nu=1}^{\infty} (1 - x^{\nu})^{-\nu^r} = \sum_{n=0}^{\infty} a(r,n) x^n.$$

(The case $r = 1$ gives the number of plane partitions of n.) Generalized Dedekind sums occur naturally and are studied using the Finite Fourier Transform. The methods used are unorthodox; many of the computations are not justified but the result is in many cases very good numerically. The last section gives various formulas for Kinkelin's constant.