

1994 Paper 2 Question 1

A partition of n into r is a set $\{S_i\}$ of r strictly positive integers such that

$$\sum_{i=0}^{r-1} S_i = n$$

Derive a recurrence from which one could tabulate the Stirling numbers of the second kind $S(n, r)$, which are the numbers of distinct partitions of n into r .

[8 marks]

Show how the tabulation may be started, assuming $S(0, 0) = 1$, and giving other boundary values.

[4 marks]

$T(n, r)$ are similar numbers where some of the r integers are allowed to be zero (n.b. they can't all be!). Relate $T(n, r)$ to the Stirling numbers.

[8 marks]