

PARTITION COUNTING

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Prerequisites: 231, 232

ABSTRACT. A partition of a natural number $n \in \mathbb{N}$ is a non-increasing sequence of natural numbers (n_1, \dots, n_k) summing to n . Given a number $n \in \mathbb{N}$, mathematicians naturally desire to count the number of partitions of n , denoted $p(n)$. We will discuss a well-known theorem in combinatorics known as Euler's Pentagonal Number Theorem. We will then introduce generating functions and outline how they can be used alongside Euler's Pentagonal Number Theorem to derive a recursive formula for $p(n)$.

REFERENCES

1. Andrews, G., Eriksson, K. (2004). Integer Partitions. Cambridge: Cambridge University Press. doi:10.1017/CBO9781139167239