Proof of $Q(n,k) = R(n,k)$

Let λ be a partition of n such that the largest number is at most k.

Consider the Ferrer diagram of λ, denoted by F.

There will be at most at k rows of F, as largest number in λ is k.

Consider the transpose of F, denoted by F'. Let this represent the partition λ'.

F' has at most k columns or λ' has at most k numbers.

Since, Ferrer diagrams are unique for any partition, there exists a bijection from the set of all partitions of n such that the largest number is at most k to the set of all partitions of n such that it has at most k numbers.

Therefore, the cardinality of the two sets is the same or $Q(n,k) = R(n,k)$.

Q.E.D.