

PARTITIONS WITH RELATIVELY PRIME PARTS AND SOME CONGRUENCE

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A set A of positive integers is relatively prime if $\gcd(A) = 1$. A partition of n is relatively prime if its parts form a relatively prime set. The number of partitions of n into exactly k parts is denoted by $p(n, k)$ and the number of relatively prime partitions into exactly k parts is denoted by $p_{\Psi}(n)(n, k)$. In our talk we will give explicit formulas for $p(n, 3)$ and prove an identity expressing $p_{\Psi}(n)(n, 3)$ in terms of the Jordan's totient function of order 2. Among other things, using the main theorem of our talk we will obtain the following beautiful result. For any prime $p > 3$,

$$p_{\Psi}(p)(p, 3) = (p^2 - 1)/12.$$

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