

Homework # 3, MAT 498

Presentation due Feb. 5, in written form due Feb. 7

1. Show that the number of partitions of n in which only odd parts may be repeated equals the number of partitions in which no part appear more than three times.

2. (a). Compute $p(n)$ for $n \leq 10$ by definition. Do you think you can handle $p(20)$ by this way?

(b). Compute $p(n)$ for $n \leq 20$ by using the formula

$$\begin{aligned} p(n) &= \sum_{k>0} (-1)^{k-1} \left(p\left(n - \frac{1}{2}k(3k-1)\right) + p\left(n - \frac{1}{2}k(3k+1)\right) \right) \\ &= p(n-1) + p(n-2) - p(n-5) - p(n-7) + p(n-12) + \dots \end{aligned}$$

3. Show that $p(n, k) = \sum_{j=1}^k p(n-k, j)$.

4. Find formulas for $p(n, 1)$, $p(n, 2)$ and $p(n, 3)$.