Scrap

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1 Identities

Here are some identities that (maybe) can be shown by the WZ-method.

1. $\sum_{k=0}^{n} \binom{n}{k} = 2^n$
2. $\sum_{k=0}^{n} (-1)^k \binom{n}{k} \binom{2k}{k} 4^{n-k} = \binom{2n}{n}$
3. $\sum_{k=0}^{n} \binom{n}{k}^2 = \binom{2n}{n}$
4. $\sum_{k=-n}^{n} (-1)^k \binom{2n}{n+k}^3 = \frac{(3n)!}{n!}$
5. $\sum_{k=0}^{n} 2^k \binom{n}{k} = 3^n$
6. $\sum_{k=0}^{n} k \binom{n}{k} = n2^{n-1}$
7. $\sum_{k=1}^{n} \frac{1}{k(k-1)} = 1 - \frac{1}{n}$
8. $\sum_{k=0}^{n} \binom{k}{c} = \binom{n+1}{c+1}$
9. $\sum_{k=0}^{n} \binom{r+k}{k} = \binom{r+n+1}{n}$
10. $\sum_{k=0}^{n} \binom{m-k}{n-k} = \binom{m+1}{n}$