Exercises

16.39 [1G6]Prerequisites:[09N]. Let $f : \mathbb{R}^k \to \mathbb{R}$ be of class C^∞. Recall that, by Schwarz's theorem, permutiation of the order of partial derivatives does not change the result. Let $N(n,k)$ be the number of partial (potentially different) derivatives of order n: show that $N(n,k) = \binom{n+k-1}{k-1}$ (which is a polynomial with integer coefficients in the variable n, of order $k-1$).

Solution 1. *[1G7]*