Hamada's formula

LaTeX exercise

In the formula below, $\dim C^*(r,n,q)$ is the rank over $\mathbf{F}_p$ of a certain matrix. For $q = p^h$ with p prime,

$$\dim C^*(r,n,q) = \frac{q^{n+1}-1}{q-1} - \sum_{(s_0,\ldots,s_h)} \prod_{j=0}^{h-1} \sum_{i=0}^{L(s_{j+1},s_j)} (-1)^i \binom{n+1}{i} \binom{n+s_{j+1}p-s_j-ip}{n},$$

where the first sum is over all ordered sets $(s_0,\ldots,s_h)$ of $h+1$ integers s_j such that

$$s_h = s_0,\ 0 \le s_j \le n-r,\ 0 \le s_{j+1}p - s_j \le (n+1)(p-1),$$

and

$$L(s_{j+1},s_j) = \lfloor (s_{j+1}p - s_j)/p \rfloor.$$