7233 Polynomial

A polynomial $f(k)$ of degree t with integral coefficients is given as $f(k) = c_0 + c_1k + c_2k^2 + \ldots + c_tk^t$, where the coefficients c_0, ..., c_t are all integers. Here, we are interested in the sum $S(n)$ of $f(0)$, $f(1)$, ..., and $f(n)$ for any nonnegative integer n. That is, $S(n)$ is defined by:

$$S(n) = \sum_{k=0}^{n} f(k) = f(0) + f(1) + \ldots + f(n).$$

The sum $S(n)$ is a polynomial, too, but is of degree $t+1$ and rational coefficients. It can thus be represented by:

$$S(n) = \frac{a_0}{b_0} + \frac{a_1}{b_1}n + \frac{a_2}{b_2}n^2 + \ldots + \frac{a_{t+1}}{b_{t+1}}n^{t+1},$$

where a_i and b_i are integers that are relatively prime for each $i = 0, 1, \ldots, t+1$, or equivalently, that have no common divisor greater than 1.

Given a polynomial $f(k)$ of degree t with integral coefficients c_0, ..., c_t, your program is to compute $S(n)$ for the given polynomial $f(k)$ and to output the following value

$$\sum_{i=0}^{t+1} |a_i|,$$

where the a_i are determined as above for such a representation of $S(n) = \frac{a_0}{b_0} + \frac{a_1}{b_1}n + \frac{a_2}{b_2}n^2 + \ldots + \frac{a_{t+1}}{b_{t+1}}n^{t+1}$.

You may exploit the following known identity for polynomials: for any positive integer d and any real x,

$$(x+1)^d - x^d = 1 + \binom{d}{1}x + \binom{d}{2}x^2 + \cdots + \binom{d}{d-1}x^{d-1},$$

where $\binom{d}{i} = \frac{d!}{i!(d-i)!}$ for any integer i with $0 \le i \le d$.

Input

Your program is to read from standard input. The input consists of T test cases. The number of test cases T is given in the first line of the input. Each test case consists of only a single line containing a nonnegative integer t ($0 \le t \le 25$) and $t+1$ following integers c_0, ..., c_t, with $-10 \le c_0, \ldots, c_t \le 10$ and $c_t \ne 0$. This fully describes the input polynomial $f(k) = c_0 + c_1k + c_2k^2 + \ldots + c_tk^t$ of degree t with coefficients c_0, ..., c_t.

Output

Your program is to write to standard output. Print exactly one line for each test case. The line should contain an integer representing the value $\Sigma_{i=0}^{t+1}|a_i|$.

The following shows sample input and output for three test cases.

Sample Input

```
3
3 1 1 1 1
5 0 -1 0 1 0 -1
5 -3 10 9 2 -7 5
```

Sample Output

```
17
6
206
```