A polynomial equation has the following form:

$$a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \ldots + a_1 x^1 + a_0 = 0$$

Here x is variable and a_n, a_{n-1}, ... etc. are known as coefficient. So to specify a polynomial equation we need the values of the coefficients only. The roots of a polynomial equation are the values of x for which the value of LHS is zero. In this problem you will have to find the roots of a polynomial equation. You can assume that a polynomial equation of degree n should have n real roots and all the roots are strictly different.

Input

The input file contains less than 5001 lines of input.

Each line contains an integer N ($N \leq 5$) followed by $(N + 1)$ floating point numbers. Here N is the order of the polynomial equation. The next $(N + 1)$ numbers denote the values of a_n, a_{n-1}, a_{n-2}, ..., a_1, a_0. These absolute values of these coefficients will be less than 1e9 or 1000000000 and the absolute values of the roots will be less than 25. So each line contains information about one polynomial equation.

Input is terminated by a line where $N = 0$.

Output

For each line of input produce one line of output. This line starts with the string '`Equation` S`:`' here S is the output serial number as shown in the sample output. This string is followed by N floating point numbers, which are the roots of the corresponding input equation. The roots should be printed in ascending order of their values and rounded up to four digits after the decimal point. All the root values are preceded by a single space. The judge input is designed in such a way that if your precision is relatively low (values less than 1e-10 are considered as zero) you will face no precision errors. Of course your solution must be correct and you must be well aware of the limitations of different root finding methods.

Sample Input

```
2 1 -9.5750000000 -179.5585140000
4 1 53.3120000000 958.2510390000 6677.1763593480 15733.6254955064
```

Sample Output

```
Equation 1: -9.4420 19.0170
Equation 2: -22.8060 -18.1170 -6.7350 -5.6540
```