Let

$$P(x) = a_n x^n + a_{n-1} x^{n-1} + \ldots + a_1 x + a_o.$$

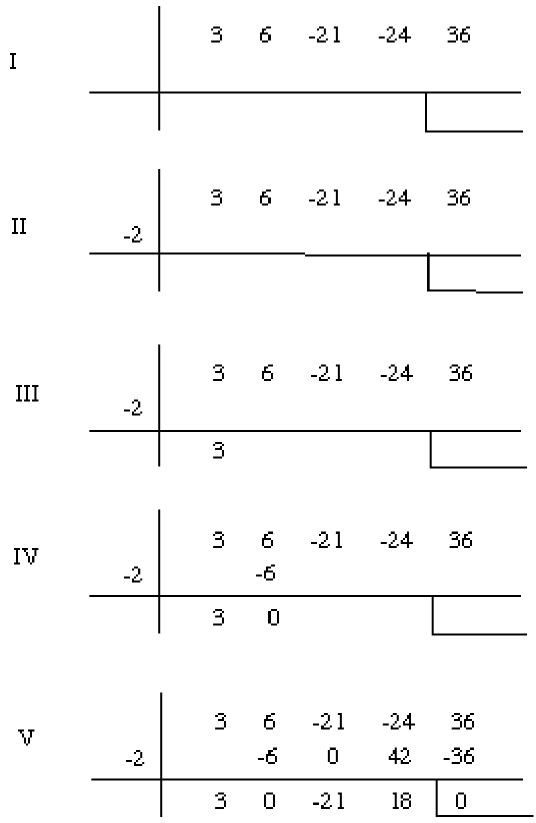
be a n-th degree polynomial with coefficients $a_o, \ldots, a_n$. If z is a root of $P(x)$, that is, $P(z) = 0$, then the first degree polynomial $(x-z)$ divides $P(x)$, that is, $P(x) = (x-z)Q(x)$, where $Q(x)$ is a polynomial with a degree less than n. In the same way, if w is a root of $Q(x)$, then $Q(x) = (x-w)R(x)$, and, obviously, $P(x) = (x-z)(x-w)R(x)$, which means that w is a root of $P(x)$, also. This means that the more roots of $P(x)$ we know, the easier it is to know the ones we don't know, because we are obtaining polynomials of decreasing degrees. When, finally, we obtain a 2nd degree polynomial, $ax^2 + bx + c$, as a result of the division, we have a very simple way of finding its two roots: we use the quadratic formula

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

to compute them.

How can we find $Q(x)$, such that $P(x) = (x-z)Q(x)$, having $P(x)$ and one of its roots, z? That is, how can we divide $P(x)$ by $(x-z)$? We describe here the **Ruffini** rule, a simple process for dividing polynomials by 1st degree polynomials of the form $(x-z)$:

- On a first line we write the coefficients of $P(x)$ (see figure I).
- On a second line we write the root of the polynomial $(x-z)$, which is z (see figure II).
- On the third line we start by writing the first coefficient of $P(x)$ which is 3 (see figure III).
- Then we write on the second line, right below the second coefficient of $P(x)$, the value -6 which is the product of z (which is -2) by the previous value on the third line (which is 3). Then we write on the third line, right below that -6 product value, the sum of that -6 value with the second coefficient of $P(x)$ (which is 6), which gives the value zero (see figure IV).
- We repeat the previous step for the remaining coefficients of $P(x)$ (see figure V).



At the end, we obtain on the third line the coefficients of the resulting polynomial — $Q(x)$ — and the remainder of the division (in this case is zero because we are dividing $P(x)$ by one of its roots). In figure V we see the coefficients of $Q(x)$. So, $Q(x) = x^3 + 0x^2 + 21x + 18$. The remainder of the division is zero, as expected.

Your task consists of writing a program that, given the coefficients of a nth degree polynomial, and $n-2$ roots of that polynomial, finds the other two roots. Assume that all roots are real.

Input

The input is one text file (standard input) that has, in the first line, the number k of polynomials that are to be processed. The next $3 * k$ lines contain the information about the k polynomials. The first of each set of three lines contains the value n of the polynomial degree; the second of each set of three lines contains $n+1$ values separated by spaces (the coefficients of the polynomial), and the third of each set of three lines contains $n-2$ values which represent $n-2$ roots of the polynomial. You know that there can be some repeated roots; the third line of each set of three lines contains exactly $n-2$ root values, even if some of them are repeated.

Output

The output file must have $2 * k$ lines, each pair containing each of the two unknown roots of the polynomial. Each pair of roots must be in decreasing order. These values must be rounded to one decimal place.

Sample Input

```
3
3
2 -15 36 -27
3
6
1 -3 -5 15 4 -12 0
1 -2 0 2
3
1 2.3 1 -0.3
-1.5
```

Sample Output

```
3.0
1.5
3.0
-1.0
0.2
-1.0
```