

Tricky Means

Given n strictly positive real numbers, your task is to compute the Pythagorean means:

- The arithmetic mean « A »

$$A = \frac{1}{n} \sum_{i=1}^n a_i = \frac{a_1 + a_2 + \dots + a_n}{n}$$

- The geometric mean « G » (mean of rates of growth)

$$G = \left(\prod_{i=1}^n x_i \right)^{\frac{1}{n}} = \sqrt[n]{x_1 x_2 \dots x_n}$$

- The harmonic mean « H » (mean of speeds)

$$H = \frac{n}{\frac{1}{x_1} + \frac{1}{x_2} + \dots + \frac{1}{x_n}} = \frac{n}{\sum_{i=1}^n \frac{1}{x_i}} = \left(\frac{\sum_{i=1}^n x_i^{-1}}{n} \right)^{-1}.$$

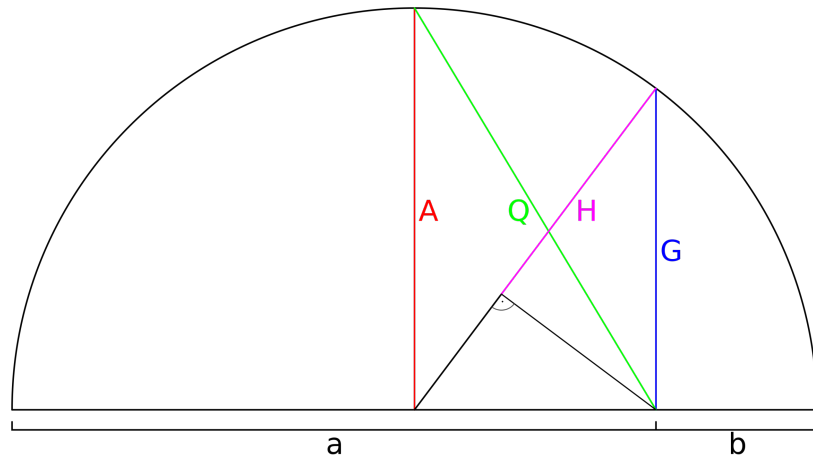


Figure 1: Geometric interpretation of the Pythagorean means of two numbers a and b

Input

The first line of the input contains an integer T denoting the number of test cases. The description of T test cases follows. Each test case is described in two lines: the first line contains a single integer « n » ($1 \leq n \leq 100$) indicating the number of the strictly positive real numbers and the second line contains « n » space-separated strictly positive real numbers.

Output

For each test case, print a single line containing three space-separated integers: « A », « G », « H » which are respectively the arithmetic, the geometric and the harmonic means of the given strictly positive real numbers. Each mean must be given with a precision of 10^{-9} .

Example

Input:

```
3
5
4 36 45 50 75
6
1.0 2.0 4.0 7.0 14.0 28.0
8
1.0 2.0 3.0 4.0 9.0 12.0 18.0 36.0
```

Output:

```
42.000000000 30.000000000 15.000000000
9.333333333 5.291502622 3.000000000
10.625000000 6.000000000 3.388235294
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