Area Under Curves and Volume of Revolving a Curve

Problem Statement

Definite Integrals via Numerical Methods

This relates to definite integration via numerical methods.

Consider the algebraic expression given by:

$(a_1)x^{b_1} + (a_2)x^{b_2} + (a_3)x^{b_3} .....(a_n)x^{b_n}$

For the purpose of numerical computation, the area under the curve y = f(x) between the limits a and b can be computed by the Limit Definition of a Definite Integral.

Some background about **areas and volume computation**.

Using equal Sub-Intervals of length = 0.001, you need to

1. Evaluate the area bounded by a given polynomial function of the kind described above, between given limits *L* and *R*.

2. Evaluate the volume of the solid obtained by revolving this polynomial curve around the X-Axis.

A relative error margin of 0.01 will be tolerated.

Input Format
First line will contain *N* integers separated by spaces, which are the values of $a_1, a_2...a_N$.

Second Line will contain *N* integers separated by spaces, which are the values of $b_1, b_2...b_N$.

The third Line will contain two space separated integers, *L, R*, which are the lower and upper limits of the range in which integration needs to be performed.

Constraints
-1000 <= a <= 1000
-20 <= b <= 20
1 <= L < R <= 20

Output Format

The first Line will contain the area between the curve and the x-axis, bound between the specified limits. The second Line will contain the volume of the solid obtained by rotating the curve around the x-axis, between the specified limits.

Sample Input

```
1 2 3 4 5
6 7 8 9 10
1 4
```

Explanatory Note

The algebraic expression represented by

$(1)x^6 + (2)x^7 + (3)x^8 + (4)x^9 + (5)x^{10}$

We need to find the area of the curve enclosed under this curve, between the limits x=1 and 4. And, we also need to find the volume of the solid formed by revolving this curve around the x-axis between the limits x = 1 and 4.

Sample Output

```
2435300.3
26172951168940.8
```

Scoring

All test cases are weighted equally. You need to clear all the tests in a test case.