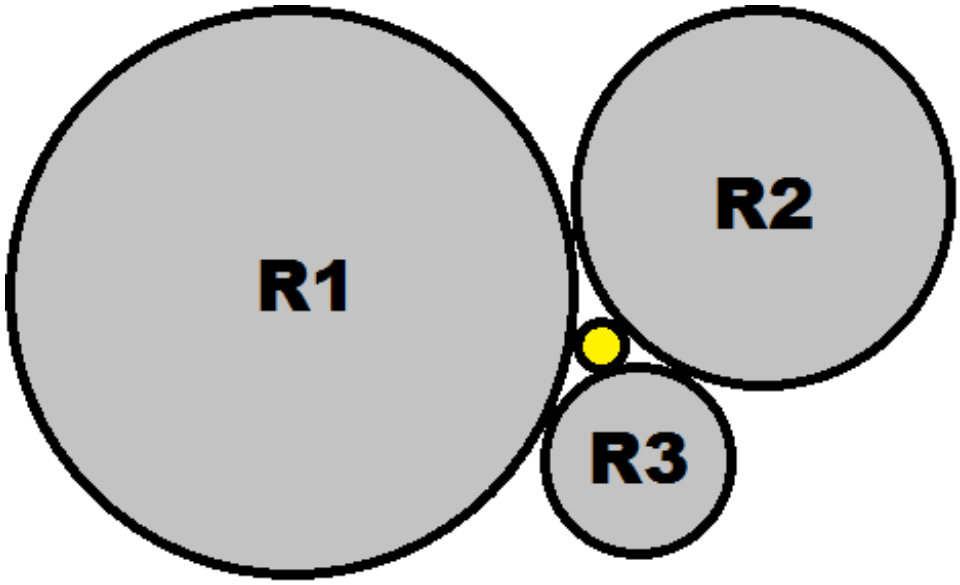
Three Circle Problem (HARD)

Given 3 distinct circles with positive integer radius **R1**, **R2**, and **R3**, and arranged like in the picture below:



Now, your task is to compute radius of small circle that can be created like yellow circle in the picture above. All circles in the picture above tangent each other.

Input

The first line in the input data, there is an integer **T**($0 < \mathbf{T} \leq 10^5$) denoting number of test cases, than **T** lines follow.

For each lines, there are three integer **R1**, **R2**, and **R3**, ($0 < \{\mathbf{R1}, \mathbf{R2}, \mathbf{R3}\} < 10^{30}$) denoting radius of each circle like in the picture above.

Output

For each test case, output radius of small circle that can be made, like in the picture above. Truncate the output to 50 digit after decimal point.

Example

Input:
3
1 1 1
10 10 10
23 46 69

Output:
0.15470053837925152901829756100391491129520350254025
1.54700538379251529018297561003914911295203502540253
6.00000000000000000000000000000000000000000000000000

You can see my submission history and time record for this problem: here

See also: Another problem added by Tjandra Satria Gunawan