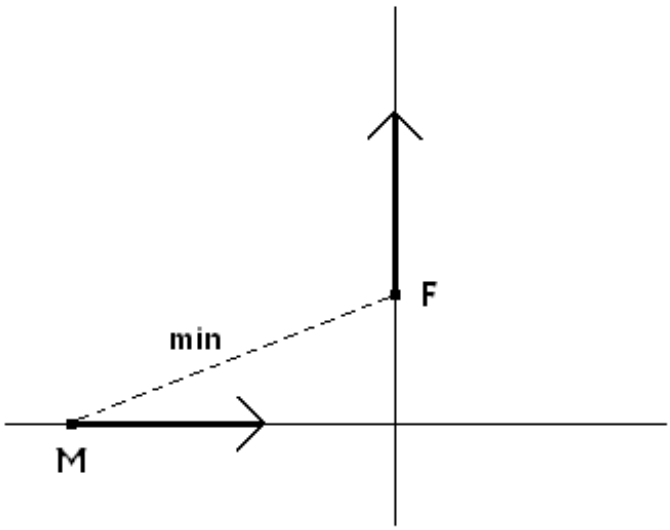
Minimal distance

Matt and Filip love to ride a bike. Matt is currently riding west to east at constant speed V_M [m/s], and Filip is riding south to north at constant speed V_F [m/s]. Both of them started riding at the same time, when Matt was D_M [m] before a crossroads and Filip was D_F [m] past the same crossroads. Calculate the smallest distance at which Matt and Filip will be from each other during their ride.



Input

In N($2 \le N \le 60\ 000$) lines of standard input there are four integer values V_M, D_M, V_F, D_F ($2 \le V_M$, D_M, V_F, $D_F \le 100\ 000\ 000$) separated by spaces. In line N+1 there are four zeros separated by spaces. Do not process this test case.

Output

Write out N lines to standard output. For each test case, write the minimal distance between Matt and Filip in a separate line. Preserve the order of lines from the input. The relative error of your result shouldn't exceed 0.000001

Example

Input:
17 286 34 139
12 130 9 107
31 309 22 74
38 192 26 73
29 50 27 118
0 0 0 0
Output:
317.96887
163.6
239.180354
168.66674

128.156155

Scoring

For solving this problem you will score 10 points.