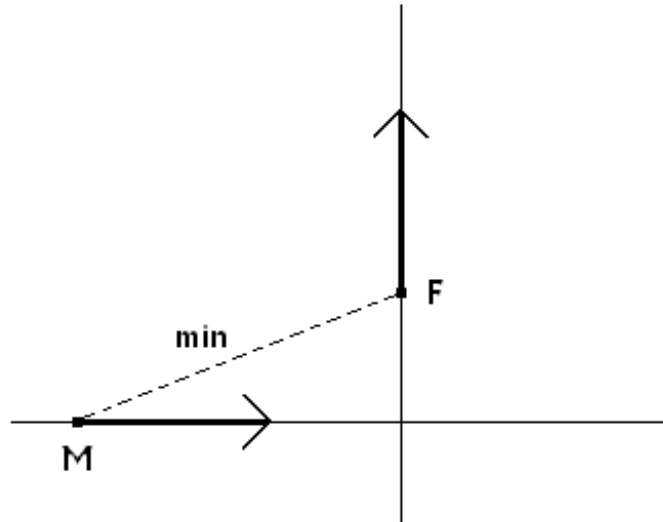


# Minimal distance

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  $N$  ( $2 \leq N \leq 60\,000$ ) lines of standard input there are four integer values  $V_M, D_M, V_F, D_F$  ( $2 \leq V_M, D_M, V_F, D_F \leq 100\,000\,000$ ) 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.