

## Football rivalry (2)

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Two long-time rival football teams, let us call them  $B$  (for beautiful manners) and  $M$  (for miserable — very, very miserable — manners), are playing again. Both teams are exhausted, so the first to score a goal will win the game for sure. At this moment, team  $B$  has the ball. If they decide to attack, there is a probability  $w_B$  that they manage to score, thus winning the game. However, with probability  $\ell_B$  they will receive a goal, thus losing the game. With probability  $1 - w_B - \ell_B$  they will just lose the possession of the ball. Team  $B$  has another option: to pass the ball around. In that case, the possession of the ball will eventually go to team  $M$ . Then we will have a simmetrical situation: If team  $M$  goes for an attack, they will immediately win with probability  $w_M$ , they will immediately lose with probability  $\ell_M$ , and the ball will go back to team  $B$  with probability  $1 - w_M - \ell_M$ . If they decide to just pass the ball and wait, eventually the possession of the ball will go back to team  $B$ .

Given  $w_B$ ,  $\ell_B$ ,  $w_M$  and  $\ell_M$ , and assuming that both teams take the best decisions (to attack or not to attack) and that team  $B$  has the ball now, which is the probability that team  $B$  will win?



## Input

Input consists of several cases, each one with four real numbers  $w_B$ ,  $\ell_B$ ,  $w_M$  and  $\ell_M$  between 0 and 1. Assume  $w_B + \ell_B \leq 1$  and  $w_M + \ell_M \leq 1$ .

## Output

For every case, print the probability that team  $B$  will win with four digits after the decimal point. (The input cases have no precision issues.) A situation where no goal will be scored (an eternal tie) is similar to a fifty-fifty situation. Consequently, print “0.5000” in this case.

## Sample input 1

```
1 0 0.7 0.2
0.3 0.6 1 0
0 0 0.3 0.6
0 0 0.1 0
0.4 0.2 0 1
0 1 0.4 0.2
0.4 0.2 0.4 0.2
0 0 0 0
```

## Sample output 1

```
1.0000
0.3000
0.5000
0.0000
0.6667
0.3333
0.5714
0.5000
```

## Problem information

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