

Collision

SEASON 6 – ROUND FOUR – 150 points



Two circles are living in an infinite plane. They move in straight lines without thinking about the risk of a collision. At a time $t \geq 0$ each circle will be in position $(X + \text{speed_X} * t, Y + \text{speed_Y} * t)$ depending on its initial parameters. We will consider that the two circles are colliding if the distance between them $\text{dist} \leq R1 + R2$. Your task is to make a program that checks whether two objects will collide.

Note:

If at first the two objects intersect or touch we will consider that the time to the collision is 0.

Input

The first two rows of the file `collision.in` will contain five numbers, the first two will be the coordinates of the centers of the circle, after that you will receive radius and the speed of the circle relative to the X-axis and speed of the circle relative to the Y-axis.

Output

In the output file `collision.out` print one number corresponding to the time to the moment of the collision. If the circles will never collide then you must print -1.

The answer must be printed with four digits accuracy after the decimal point.

Constraints

The numbers in the file will be written with up to six characters accuracy.

Time limit: 0.5 sec

Memory limit: 256 MB

Example test

Input (<code>collision.in</code>)	Output (<code>collision.out</code>)
1 1 1 0 50 0 0 5 0 -50	0.0000
-10 0 1 2 1 10 0 1 -2 1	4.5000
-10 0 1 -2 1 10 0 1 2 1	-1