
Circles (2)**P39799_en**

To solve this exercise you will need the definitions and the procedures of problems P46254 and P84786.

Write a procedure that reads a point:

```
void read(Point& p);
```

which is in the input with the two reals x and y in this order.

Write also a procedure that reads a circle:

```
void read(Circle & c);
```

which is in the input with the three reals x , y , and $radius$ in this order.

Use all this to write a program that reads a circle c and an initial point p , and moves p according to the input, and prints when p go in or go out of c . Suppose that p will never be exactly in the border of c .

Input

Input starts with a line with the circle c (three reals, the last one strictly positive) and a line with the point p (two reals). Then a natural number n comes followed by n lines, each one with a point that indicates the following move of p .

Output

Your program must print the initial situation of p regard to c , and the moments that the point goes in or goes out of the circle. Follow the format of the examples.

Sample input 1

```
0 0 4.5
1 1
5
10 1
0 0
-10 -1
0.5 0.5
0 -20
```

Sample input 2

```
5 10 2.5
2 2
3
-1 -1
-1 -1
-1 -1
```

Sample output 1

```
initially inside
in the step 1 has gone out
in the step 3 has gone in
in the step 5 has gone out
```

Sample output 2

```
initially outside
```

Problem information

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