

G - Hexagon Intersections

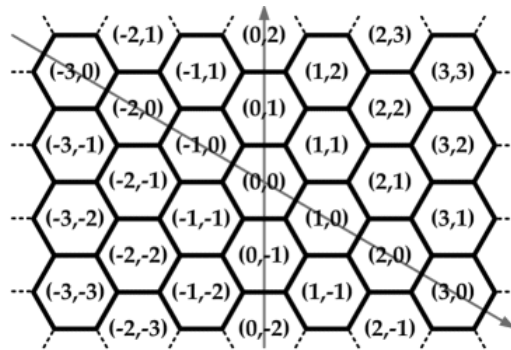
Input: standard input

Output: standard output

A hexagonal grid is a tiling of the plane consisting solely of regular hexagons. You will be given two pairs of coordinates, identifying two hexagons in the grid. Consider a line segment connecting the centers of these two hexagons, and print the number of hexagons that this line segment intersects.

Only count hexagons if the line passes through their interior. Do not count a hexagon if the line only intersects one of its corners or is coincident with one of its edges.

Hexagons will be identified by a pair of coordinates, as shown in the following diagram. The first coordinate is proportional to the horizontal distance from the vertical axis. The second coordinate is proportional to the vertical distance from the diagonal axis.



Input

The problem input consists of several cases, each one defined two lines. The first line contains two integer values x_0 and y_0 ($-10000 \leq x_0, y_0 \leq 10000$), representing the coordinates of the first hexagon. The second line contains two integer values x_1 and y_1 ($-10000 \leq x_1, y_1 \leq 10000$), representing the coordinates of the second hexagon. (x_0, y_0) and (x_1, y_1) will not be the same point.

The end of the input is specified by a line with the string “* *”.

Output

Per testcase print one line with the number of hexagons that the described line segment intersects.

Sample Input

```
1 -2
3 1
-2004 -1002
-2000 -1000
54 93
```

```
64 95
0 0
19 20
0 0
19 -20
* *
```

Sample Output

```
4
3
11
26
40
```

This problem statement is the exclusive and proprietary property of TopCoder, Inc. Any unauthorized use or reproduction of this information without the prior written consent of TopCoder, Inc. is strictly prohibited. (c)2006, TopCoder, Inc. All rights reserved.

You may feel free to use old TopCoder algorithm problems for non-commercial, educational purposes. Just be sure to carry over the copyright notice in any reproduction of the problem statement.