# 11657   Rational Billiard

The International Billiard Manufactory (IBM) builds the best billiard tables in the world. Its last product is the Rational Billiard, which is a friction-less table with volume-less balls. This means that balls just occupy a point in the space, and once they are struck with the cue, they move on the table with constant velocity, until they hit another ball.

IBM wants you to build a program to analyse the behavior of balls in the Rational Billiard. The program has to decide whether a ball, struck with certain angle, will hit another ball in certain position. The figure shows the configuration of the table and the balls: m and n are integer values that indicate the size of the table. (x_1, y_1) and (x_2, y_2) are the coordinates of the first and second ball respectivelly, with $0 < x_1, x_2 < m$ and $0 < y_1, y_2 < n$. The direction in which the first ball is struck is determined by the integer values p and q. More precisely, the slope $\frac{q}{p}$ determines the

hitting direction of the cue, where p and q cannot be zero simultaneously. A value of $p = 0$ means that the ball moves parallel to the vertical axis, according to the sign of q. When the ball hits an edge, it rebounds like if the edge were a mirror (*incidence angle = reflection angle*). In the special case when the ball hits a corner, it is reflected on the same line but in the opposite direction of arrival. Finally, spin effects are neglected, too.
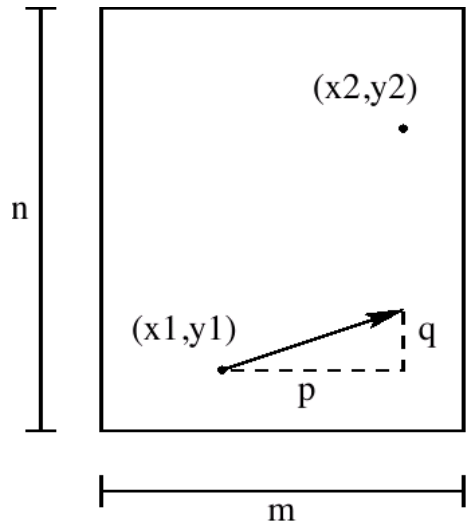
Input

Each line in the input corresponds to a test case specified by eight integer values: $m, n, x_1, y_1, x_2, y_2, p$ and q, with $0 < m, n \leq 1000$, $0 < x_1, x_2 < m$, $0 < y_1, y_2 < n$, $-1000 \leq p, q \leq 1000$, and $|p| + |q| > 0$.

The end of the input is specified by a line with the string '0 0 0 0 0 0 0 0'.

Output

For each test case, the program must output a line with the the text 'HIT' if the first ball hits the second ball, or 'MISS' if it does not.

Sample Input

```
4 4 3 1 1 1 1 1
4 4 3 1 2 2 1 1
0 0 0 0 0 0 0 0
```

Sample Output

```
HIT
MISS
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