

The Imp

An Imp jumps on an infinite chessboard. Moves possible for the Imp are described by two pairs of integers: (a, b) and (c, d) - from square (x, y) the Imp can move to one of the squares: $(x+a, y+b)$, $(x-a, y-b)$, $(x+c, y+d)$, $(x-c, y-d)$. We want to know for which square different from $(0, 0)$ to which the Imp can jump from $(0, 0)$ (possibly in many moves) the value $|x|+|y|$ is the lowest.

Task

Write a program which

- reads from standard input two pairs (a, b) and (c, d) of integers, different from $(0, 0)$, describing moves of the Imp,
- determines a pair of integers (x, y) different from $(0, 0)$, for which the Imp can jump (possibly in many moves) from square $(0, 0)$ to square (x, y) and for which the value $|x|+|y|$ is the lowest.
- writes out to standard output the value $|x|+|y|$.

Input

Ten test cases. Each test consists of four numbers a, b, c, d in one line, separated by spaces.
 $-100000 \leq a, b, c, d \leq 100000$

Output

For every test case your program should write a single line with a number equal the lowest possible value $|x|+|y|$.

Example

Input:

13 4 17 5

[and 9 test cases more]

Output:

2

[and 9 answers more]