K: Feed candies

- Time Limit: 2 sec

You are playing a game to bring a slime up. The slime has two integral parameters called *softness* and *transparency*. In this game, there are 10^{100} types of candies numbered from 1 to 10^{100}, and if you feed the i-th type of candy to the slime, its softness and transparency increase by s_i and t_i, respectively. Here, you know that s_i and t_i are calculated by the following formulae where A and B are integers.

- $(s_1, t_1) = (1, 0)$
- $(s_i, t_i) = (As_{i-1} - Bt_{i-1}, Bs_{i-1} + At_{i-1})$ for each $2 \leq i \leq 10^{100}$

In addition, the slime likes eating new types of candies. Therefore, you can feed each type of candy at most once.

Initially, the slime's softness and transparency are both zero. Your objective is to feed zero or more types of candies to the slime so that the slime's softness and transparency become X and Y, respectively. Determine whether this is possible, and if it is possible, find such a way.

In the first sample input, the characteristics of the first four types of candies are as follows.

- $(s_1, t_1) = (1, 0)$
- $(s_2, t_2) = (2, -1)$
- $(s_3, t_3) = (3, -4)$
- $(s_4, t_4) = (2, -11)$

If you feed the first, second and fourth types of candies to the slime, the slime's softness and transparency become $1 + 2 + 2 = 5$ and $0 + (-1) + (-11) = -12$, respectively.

Input

The input consists of multiple datasets. Each dataset is represented in the following format.

A B X Y

Each dataset consists of a single line which contains four integers A, B, X and Y. You may assume that $-100 \leq A \leq 100$, $-100 \leq B \leq 100$, $-10^{16} \leq X \leq 10^{16}$, $-10^{16} \leq Y \leq 10^{16}$ and $|A| + |B| \geq 2$.

The end of the input is represented by a line consisting of four zeros. The number of datasets should not exceed 200.

Output

For each dataset, if your objective is unachievable, print -1 in a single line. Otherwise, let m be the number of types of candies you feed to the slime. Print m on the first line. Then, for each $1 \leq k \leq m$, on the $(k+1)$-st line print the k-th smallest type of candy you feed to the slime.

If there are multiple correct answers, print any of them.

Examples

Input	Output
2 -1 5 -12 2 0 33 0 -10 0 123 0 -4 7 143800796 -5765753 0 0 0 0	3 1 2 4 2 1 6 -1 1 10