
2015 Mid-Atlantic Regional Programming Contest
Draft November 10, 2015

Problem A: Positive Con Sequences

Your younger sister is studying for an upcoming standardized test in mathematics, and needs practice with the common style of problem in which the student is presented with a sequence of numbers with one number missing and asked to fill in the missing value.

You are aware that the vast majority of these problems feature either arithmetic sequences (where each number in the sequence is formed by adding an integer constant to the prior number) or geometric sequences (where each number in the sequence is formed by multiplying the prior number by an integer constant).

Write a program that will help your sister drill on this style of problem by allowing her to check her answers on sample problems.

Input

Input will consist of one or more datasets.

Each dataset will be a single line containing 4 integers defining a sequence. One of these will be -1 , denoting the missing value. The remainder will be positive integers in the range $1 \dots 10,000$, inclusive. Other than the -1 placeholder value, the values will be in strictly increasing order.

End of input will be signaled by a line containing four -1 values.

Output

For each dataset, print one line of output.

If a positive integer in the range $1 \dots 1,000,000$ exists that can be filled in to the missing value position to create an arithmetic or geometric sequence, print that missing value.

If there is no such positive integer, print -1 .

Example

Given the input:

```
1 2 -1 4
2 4 8 -1
7 8 -1 21
5 -1 11 14
-1 2 4 6
-1 -1 -1 -1
```

the output should be:

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3
16
-1
8
-1