It is well-known that the number of occurrences of the term "free" can distinguish spam and non-spam emails. Your task is to build a spam detection module, based on the number of term "free" in an email.

The core of this detection module is a spam classifier, which is represented by two variables: *Low* and *High*. An email that contains *X* "free" words is classified by this module as a spam if *Low* <= *X* <= *High*, otherwise it is not.

To measure the goodness of a classifier, we introduce several information-retrieval terminologies:

		Actual	
		Spam	Not Spam
Predicted	Spam	TP	FP
	Not Spam	FN	TN

TP (true positive) is the number of emails which are truly predicted as spam; FN (false negative) is the number of emails which are wrongly predicted as non-spam, and so on.

The portion of emails that are correctly identified as spam is denoted as precision (P), which is formulated as P = TP / (TP + FP). The portion of spam emails that are successfully identified is denoted as recall (R), which is formulated as R = TP / (TP + FN). To balance between precision and recall, we use the F-measure which is formulated as F = 2 x P x R / (P + R). For example, when TP = 5, FP = 3, FN = 2, TN = 4, we have R = 5/7, P = 5/8, and F = 2/3.

When there is no spam, we can report all emails as non-spam with F = 1.0 (perfect classifier).

Our data mining team has manually analyzed several emails and labeled them as spam or non-spam. Your task is to find the values of *Low* and *High* that yield the best classifier, i.e., the one that maximizes the F-measure.

Input

The input consists of several test cases, where each case contains of two lines:

N : The maximum number of term "free" in any emails ($1 <= N <= 2 \times 10^6$)
a_0 *A B M* : parameters of random number generator. ($2 <= M <= 10; 0 <= a_0, A, B < M$)

This random number generator generates a sequence of number: $a_i = (A * a_{i-1} + B)$ MOD *M* for i >= 1

Specifying:

$pos_i = a_{2i}$ ($0 <= i <= N$) : the number of spam emails with *i* number of term "free".

$neg_i = a_{2i+1}$ ($0 <= i <= N$) : the number of non-spam emails with *i* number of term "free".

The input is terminated by EOF.

Output

For each simulation print the F-measure of the best classifier (accurate to 6 decimal places).

Sample Input

```
3
1 1 1 3
5
2 3 4 5
```

Sample Output

```
0.666667
0.923077
```

Explanation for 1st sample test case:

This random number generator generates a sequence of 1, 2, 0, 1, 2, ... The number of spam emails is: pos_i = {1, 0, 2, 1}, and the number of non-spam emails is neg_i = {2, 1, 0, 2}. The optimal classifier treats emails with number of term "free" between 2 and 3 as spam, with R = 3/4 and P = 3/5, resulting F = 2/3. Another way of producing optimal classifier is to consider emails with number of term "free" equals to 2 as spam.

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