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## Sign Wave

Problem code: SIGNWAVE



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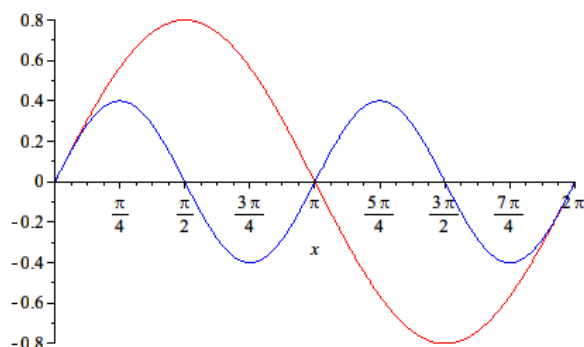
Read problems statements in [Russian](#).There are  $S$  sine functions and  $C$  cosine functions as following:

$$a_i \sin(2^i x), 0 \leq x \leq 2\pi, \text{ for } i = 0, 1, \dots, S-1,$$

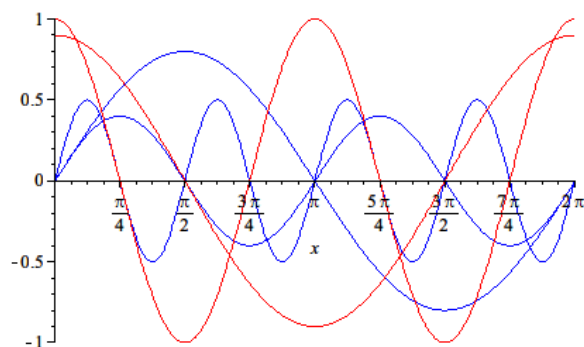
$$b_j \cos(2^j x), 0 \leq x \leq 2\pi, \text{ for } j = 0, 1, \dots, C-1,$$

where  $a_i, b_j$  are some positive constants (and note that the answer of this problem does not depend on  $a_i$  and  $b_j$ ).

For example, the following figures show the case of  $S = 2, C = 0$  and the case of  $S = 3, C = 2$ .



This figure shows the case of  $S = 2, C = 0$ . There are two sine functions  $a_1 \sin(x)$  denoted by the red line, and  $a_2 \sin(2x)$  denoted by the blue line.



This figure shows the case of  $S = 3, C = 2$ . There are five functions  $a_1 \sin(x)$ ,  $a_2 \sin(2x)$ ,  $a_3 \sin(4x)$ ,  $b_1 \cos(x)$  and  $b_2 \cos(2x)$ . In the figure, three sine functions are denoted by blue lines, and two cosine functions are denoted by red lines.

Chef wants to find the number of the points on the  $x$ -axis such that at least  $K$  functions through the points.

### Input

The first line of input contains an integer  $T$ , denoting the number of test cases. Then  $T$  test cases follow.

Each test case contains one line. The line contains three space-separated integers  $S, C, K$ .

### Output

For each test case, print the number of the points on the  $x$ -axis such that at least  $K$  functions through the points.

### SUCCESSFUL SUBMISSIONS

User	Score	Mem	Lang	Solution
shivamtyagi	100.000	2M	C	<a href="#">View</a>
stanoje	100.000	2M	C	<a href="#">View</a>
ag970221	100.000	2M	C	<a href="#">View</a>
rishabh1132	100.000	2M	C	<a href="#">View</a>
guruji	100.000	2M	C	<a href="#">View</a>
ucinight	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>
aj5774	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>
coder_ankur	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>
nanaya	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>
knsn	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>
igcstar	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>
dip94_2013	100.000	2.6M	C++ 4.3.2	<a href="#">View</a>

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**Constraints and Subtasks**

- $1 \leq T \leq 200$

**Subtask 1: 15 points**

- $0 \leq S \leq 12$
- $0 \leq C \leq 12$
- $1 \leq K \leq 25$

**Subtask 2: 30 points**

- $0 \leq S \leq 50$
- $C = 0$
- $1 \leq K \leq 50$

**Subtask 3: 25 points**

- $0 \leq S \leq 50$
- $0 \leq C \leq 50$
- $K = 1$

**Subtask 4: 30 points**

- $0 \leq S \leq 50$
- $0 \leq C \leq 50$
- $1 \leq K \leq 100$

**Example****Input:**

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

**Output:**

```
5
3
9
5
```

**Explanation**

**Example 1.** This is the case of  $S = 2, C = 0$ . So the situation is the same as the first figure in the statement. There are 5 points on the  $x$ -axis such that at least 1 function through the points. That is,  $x = 0, \pi/2, \pi, 3\pi/2, 2\pi$ .

**Example 2.** This is also the case of  $S = 2, C = 0$ . So the situation is the same as the first figure in the statement. There are 3 points on the  $x$ -axis such that at least 2 functions through the points. That is,  $x = 0, \pi, 2\pi$ .

**Example 3.** This is the case of  $S = 3, C = 2$ . So the situation is the same as the second figure in the statement. There are 9 points on the  $x$ -axis such that at least 1 function through the points. That is,  $x = 0, \pi/4, \pi/2, 3\pi/4, \pi, 5\pi/4, 3\pi/2, 7\pi/4, 2\pi$ .

**Example 4.** This is the case of  $S = 3, C = 2$ . So the situation is the same as the second figure in the statement. There are 5 points on the  $x$ -axis such that at least 3 functions through the points. That is,  $x = 0, \pi/2, \pi, 3\pi/2, 2\pi$ . For example, three sine function through the point  $x = 0$ , and two sine functions and one cosine function through the point  $x = \pi/2$ .

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Author: chandubaba

Tester: laycourse

Date Added: 6-01-2015

Time Limit: 1 sec

Source Limit: 50000 Bytes

Languages: ADA, ASM, BASH, BF, C, C99 strict, CAML, CLOJ, CLPS, CPP 4.3.2, CPP 4.9.2, CPP14, CS2, D, ERL, FOR, FS, GO, HASK, ICK, ICON, JAVA, JS, LISP clisp, LISP sbcl, LUA, NEM, NICE, NODEJS, PAS fpc, PAS gpc, PERL, PERL6, PHP, PIKE, PRLG, PYTH, PYTH 3.1.2, RUBY, SCALA, SCM guile, SCM qobi, ST, TCL, TEXT, WSPC

**SUBMIT****Comments**

[h1ashdr@gon](#) @ 6 Mar 2015 03:59 PM

Image isn't loading.

[dpraveen](#) @ 6 Mar 2015 04:18 PM

@h1ashdr@gon: Please check now.

**kyuridenamida** @ 6 Mar 2015 06:47 PM

it seems that a situation where  $a_i = 0$  or  $b_i = 0$  is unconsidered.

**laycurse** @ 6 Mar 2015 08:25 PM

@kyuridenamida The statement says  $a_i$  and  $b_j$  are positive

**laycurse** @ 6 Mar 2015 09:11 PM

@svishal Of course, you should print the number of the points on the x-axis such that at least K functions through the points, as said in the statement

**arpanb8** @ 6 Mar 2015 11:04 PM

No. of points on X-axis includes values beyond  $2(\pi)$ ???

**laycurse** @ 7 Mar 2015 03:52 AM

@arpanb8 There is no functions where  $x < 0$  or  $x > 2\pi$ .

**Need help? Post a comment. But before that please spare a moment to read the guidelines.**

Your name:  
shubhmsng

Comment: \*

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