Problem : Set of Rectangles

Problem Description

A Pythagorean triple consists of three positive integers, a, b, and c, such that $a^2 + b^2 = c^2$. Such a triple is commonly written (a, b, c). A Pythagorean triple (a, b, c) can be generated by two integers x and $y(x > y > 0)$ by setting $a = 2xy$, $b = x^2 - y^2$, and $c = x^2 + y^2$.
$\mathbb{R}=\{R_1, R_2, ..., R_i, ...\}$ is a set of rectangles. Let w_i and h_i denote the width and height of rectangle R_i, respectively. Also, let d_i denote the length of R_i's diagonal. A rectangle set $\mathbb{R}$ is called a 'Pythagorean Primitive Rectangle Set' if each rectangle in $\mathbb{R}$ holds following constraints:

1. $(w_i, h_i, d_i)$is a Pythagorean triple;
2. $w_i < h_i$
3. $\frac{h_i}{w_i} \neq \frac{h_j}{w_j}ifi \neq j$

Bill, a freshman in Pythagoras Memorial High School, got homework in his mathematics class. His homework is described as follows. Given a wire of length L, he should cut it into pieces and bend each piece of the wire to form a rectangle such that the set of rectangles obtained by the cut pieces should be a Pythagorean Primitive Rectangle Set. Note that a piece of length $2(w_i + h_i)$ is required to make rectangle R_i. For example, if rectangle R_i is represented as a pair of its width and its height, (w_i, h_i), and if the total length of the given wire is 94, Bill can cut it into 3 pieces and make a Pythagorean Primitive Rectangle Set, $\mathbb{R}$={(3,4), (5,12), (8,15)}. With the same wire of length 94, Bill can also make another Pythagorean Primitive Rectangle Set, $\mathbb{R}$={(3,4), (7,24)} in which case there remains a leftover piece. In other words, Bill does not need to use up all the wire to make a Pythagorean Primitive Rectangle Set.

Given a wire of length L, Bill wants to make as many rectangles as possible which are the members of a Pythagorean Primitive Rectangle Set. You are asked to make a program to help Bill.

Input

The input file name is `rectangles.inp`. The input consists of T test cases. The number of test cases T is given in the first line of the input. Each test case has a single integer L $(14 \leq L \leq 1{,}000{,}000)$, the total length of a wire to be cut into pieces.

Output

The output file name is `rectangles.out`. Print exactly one line for each test case. The line should show the maximum number of rectangles which can be made by the wire of length as described above.

The following shows sample input and output for two test cases.

Sample Input	Output for the Sample Input
2 14 1000	1 10