Problem F : Gardener

inputfile: input.F
outputfile: output.F

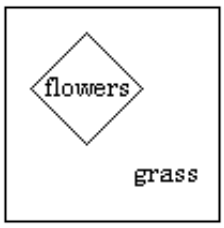
Description

Like computer programming, gardening isn't just a hobby---it's a science. Much more so if you have to design the layout of a brand new garden according to several rather mysterious boundary conditions.

This is just the problem faced by gardener Jeeve Stobs[1]. Just retiring from the computer business (which '*isn't what it used to be*', according to Mr. Stobs), he now tries to make a living out of designing gardens according to the whims and wishes of the rich and famous. His latest employer, a certain Mr. G. Bates, has given him the following requirements for the garden next to his newly built house:

- the garden is to be square, with each side measuring an integer number of feet.
- the garden must have a fence around it.
- Mr. Bates is very keen on grass. An area of N square feet (N also being an integer) will have to be covered with grass.
- Within the garden, there will have to be a square-shaped flower-bed, measuring an positive integer number of feet on each side.

Thus, a garden will look something like this:



Sometimes, it is impossible to meet the boundary conditions mentioned above. Most of the time, however, it can be done, and in those cases Mr. Stobs decides he wants to maximise his profit per square foot of garden. His profit is 0.80 dollar per square foot of flowers and 0.30 dollar per square foot of grass. The fence, which he can get very cheaply (but Mr. Bates doesn't have to know that!) earns him a profit of 80 dollar per foot.

Problem

The question is this: given N, what is the maximum profit per square foot of the garden Jeeve will design, meeting the boundary conditions mentioned above.

[1] any resemblance to actual people is purely accidental/coincidental (or isn't it?)

Input

The first line of the input contains the number of trials T ($0 \leq T \leq 10000$). After that T lines follow, each containing a number N: the area of garden which is to be covered with grass. This area is a positive integer number, less than or equal to 2000000000.

Output

For each trial a single line has to be given in the outputfile with the profit per square foot of Jeeves garden-design (exactly 4 digits precision following the floating point). If it is impossible to meet the boundary conditions, the word `impossible` has to be given.

Example

Sample input

```
8
10
100
1000
10000
100000
1000000
10000000
100000000
```

Correct output for the sample input

```
impossible
13.0337
9.5347
3.0400
1.3112
0.8512
0.8051
0.8005
```