A group of gift wrappers were having a good time in Hollywood. They used to pack gifts for the stars of Hollywood who only wanted the gift boxes to be attractive. But recently they are having a bad time as a group of mathematicians, problem setters and programmers have come to Hollywood. News has spread out in the air that they are trying to arrange a programming contest (Just imagine a contest team consisting Jim Carrey, Mr. Bean and Bill Cosby. Are you looking for a better trio? OOPS!!). The gift wrappers are given the responsibility of making the gift boxes for the contestants but the conditions of making the gift boxes are not simple. They are given below:

a) The gift boxes are all circular.

b) The gifts are all triangular with all three sides equal to one another.

c) All the gifts are of same size.

d) The height of the gifts and the height of the boxes are same, so the gifts cannot be put one upon another.

e) All gift boxes contain four or eleven gifts. Each of the top three teams gets boxes with eleven gifts and the each team occupying 4th to 10th position gets boxes with four gifts in it.

f) The gifts have unit height and so do the boxes.

g) The circular boxes must have minimum possible radius.

The contest organizing committee has supplied them the volume of one gift L. They will have to design the gift boxes with minimum radius r_4 and r_{11} that can hold all the gifts. Here r_4 is the minimum possible radius of the box with four gifts and r_{11} is the minimum possible radius of the box with eleven gifts. The figure below shows how the gift wrappers can put four and eleven gifts optimally in the gift box. The figure with eleven gift boxes is symmetric along the line AB. The helpless gift wrappers have got hold of you and they have requested you to find the minimum possible radiuses for them.

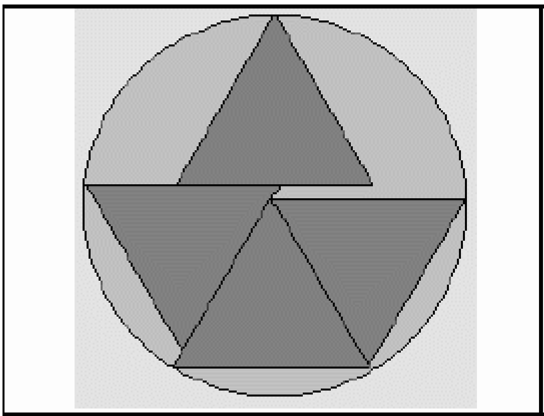

Figure: Top view of a box with four gifts.

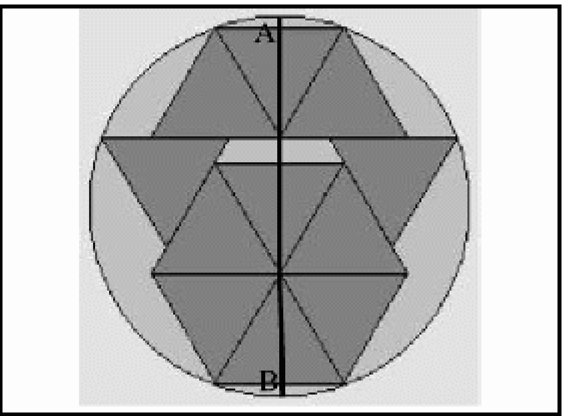

Figure: Top view of a box with eleven gifts.

Input

The first line of the input file contains a single integer $N (N \leq 1000)$ that denotes how many lines of input are there in the input file. Each of the next N lines contains a floating-point number $L (0 \leq L \leq 100000000)$ whose meaning is given in the problem statement.

Output

For each value of L produce one line of output. At first print the case number of the problem as shown in the sample output. Then there are two floating-point numbers r_4 and r_{11} rounded up to twelve digits after the decimal point. The meaning of r_4 and r_{11} are described in the problem statement. The least significant digits of the output for sample input are not shown to prevent you problem taking unnecessary advantages. You don't need to worry too much about precision errors. Errors less than $\max(10^{-7}, 10^{-5}\%)$ will be ignored.

Sample Input

```
2
0
2.30940107
```

Sample Output

```
Case 1: 0.000????????? 0.000?????????
Case 2: 2.264????????? 3.428?????????
```