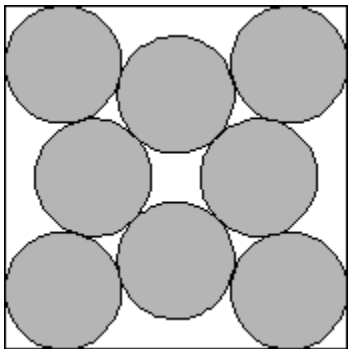
UCF Local Contest — August 31, 2013

Circles Inside a Square

filename: `circle`

You have 8 circles of equal size and you want to pack them inside a square. You want to minimize the size of the square. The following figure illustrates the minimum way of packing 8 circles inside a square:



The Problem:

Given the radius, *r*, find the area of the minimum square into which 8 circles of that radius can be packed.

The Input:

The first input line contains a positive integer, *n*, indicating the number of test cases. Each test case consists of a positive real number (between 0.001 and 1000, inclusive) in a single line denoting the radius, *r*.

The Output:

For each test case, output the area of the minimum square where 8 circles of radius *r* can be packed. Print 5 digits after the decimal. Your output is considered correct if it is within ±0.00001 of the judge's output.

Sample Input:

```
2
0.1
0.2
```

Sample Output:

```
0.34383
1.37532
```