2 Shapes within Shapes within Shapes

Arthur is a well known geologist who has traveled all across the world looking for the PERFECT geode. There have been many contenders, but none were good enough to qualify for the title of "World's Most Marvelous Geode." However, after examining the construction site near the Love building here at FSU, he may have found the one Geode to rule them all!
Now he must catalog it, and that is where you come in!
This geode is quite beautiful, and upon closer inspection you can see a pattern of shapes within. The pattern starts with a circle, and within that circle is a square, and within that square is an equilateral triangle and then the pattern repeats.

circle $\rightarrow$ square $\rightarrow$ triangle $\rightarrow$ circle $\rightarrow$ square $\rightarrow$ triangle $\rightarrow$...

In order to catalog this geode correctly, you must determine the area of each shape within the geode. Thankfully you have a magical machine called a "Plot Device" that gives the area of the outermost circle, and the total number of shapes in the pattern for that particular geode. From there, you must get the area of the largest possible perfect square within the circle, then the area for the largest possible equilateral triangle that can fit inside the square. If the pattern continues, then the next are you will need to find is the largest possible perfect circle that can fit in the triangle, and then the largest square in the circle, etc. Thankfully, the largest pattern that seems to appear is 10 shapes. Furthermore, due to budget cuts in Computer Science worldwide, doubles and floats no longer exist. As a result **all calculations that are going to be performed to determine area of any shape will use integers only.**
Things to remember about "Simple Geometry":

- Due to the budget cuts, $\pi = 3$ instead of 3.14
- Area of Circle: $\pi * r^2$ where r is the radius
- Area of Square: l^2 where l is the length of a side
- Area of Triangle: $\frac{1}{2}b * h$ where b is length of the base and h is the height
- The length of the diagonal of a square corresponds to two times the radius of a circle that circumscribes the square.

Some images to provide more insight to wonders of "Simple Geometry:

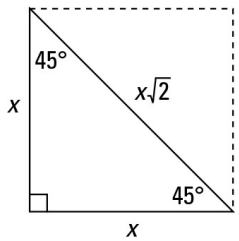

Figure 1: Triangles formed by diagonal of a square.

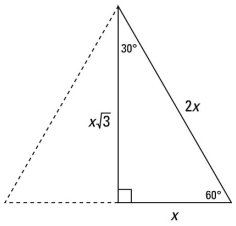

Figure 2: Determining the height of an equilateral triangle.

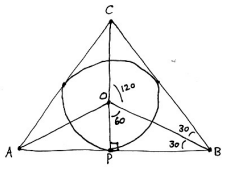

Figure 3: A circle inscribed in a triangle.

2.1 Input

Your input will be the area of the outermost circle, followed by the amount of shapes that the pattern follows.

2.2 Output

Your output should be the name of the shape followed by its area, then a newline for each shape that the pattern follows. Remember, **use only integers when performing calculations.**

2.3 Sample Input/Output

Sample Input	Sample Output
1000 5	Circle Area:1000 Square Area:625 Triangle Area:250 Circle Area:180 Square Area:64