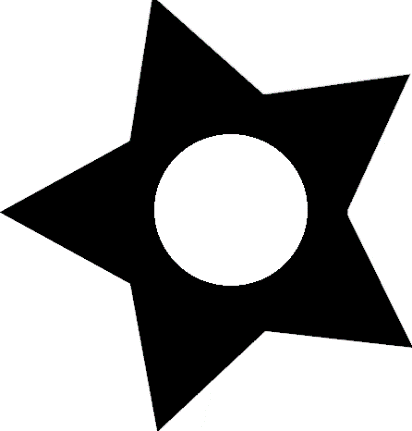
**Shuriken**

*Filename:* shuriken

A shuriken is a geometric shape that can be described as a combination of multiple shapes. The following are instructions to draw an *n*-sided shuriken:

* Draw a filled-in regular polygon with *n* sides of length *s*.
* Each of the polygon’s sides is the base of a filled-in isosceles triangle of height *h*.
* Erase a circle of diameter *d* from the middle of the shuriken. The circle must be entirely within the regular polygon.



A diagram representing a 5-sided shuriken.

The area of the above shuriken corresponds to the area of the shape in black. To become a true ninja master, you must be able to calculate it. Use the value of π = 3.14159265359 in your calculations.

**The Problem:**

Compute the total area of a shuriken.

**The Input:**

The first line of the input file begins with a single, positive integer, *t*, representing the number of shurikens. For each shuriken, one line follows, each with four integers: 3 ≤ *n* ≤ 1000, 1 ≤ *s*, *h*, *d* ≤ 1000.

It is guaranteed that the shuriken is valid - the diameter is small enough for the circle to fit entirely inside the polygon.

**The Output:**

For each shuriken, output a single line saying “Shuriken #i: c” without the quotes, where i is the number of the shuriken, and c is the shuriken’s area rounded to the nearest hundredth (1.234 rounds to 1.23 and 1.235 rounds to 1.24).

**(Sample Input and Output are on the next page)**

**Sample Input:**

2

4 4 2 2

5 6 3 2

**Sample Output:**

Shuriken #1: 28.86

Shuriken #2: 103.80