13045 Drawing Polygon

In Euclidean geometry, a regular polygon is a polygon that is equiangular (all angles are equal in measure) and equilateral (all sides have the same length). Tara drew a regular convex polygon on a paper plane. The polygon has N vertices. The lower side of the polygon is parallel to the X-axis. The lower side is the side having minimum value of $(y_a + y_b)$ among all sides of that polygon, where y_a and y_b are the y coordinate of two different end points of a side. Unfortunately her friend Gudu lost the paper. Tara only can remember the length of each side L and lower left point $P_0(x, y)$ of that polygon. Help Tara to draw the polygon again.

Input

First line of the input contains a positive integer T (≤ 20) denoting the number of test cases. Each of the following T lines contains four integers. N ($2 < N \leq 1000$), L ($0 < L \leq 100$), x ($|x| \leq 100$), y ($|y| \leq 100$) as described before.

Output

For each case, print the case number in a single line first. Print N points of the polygon in next N lines. Each point consists of two numbers rounded to six decimal places. Points should be ordered by counter-clockwise starting from P_0. Errors less than 10^{-4} will be ignored. Consecutive output set should be separated by a blank line.

See sample output format.

Sample Input

```
2
4 5 0 0
5 5 0 0
```

Sample Output

```
Case #1:
0.000000 0.000000
5.000000 0.000000
5.000000 5.000000
0.000000 5.000000
Case #2:
0.000000 0.000000
5.000000 0.000000
6.545085 4.755283
2.500000 7.694209
-1.545085 4.755283
```