Old MacDonald has a farm and on this farm he has a cow - and a fenced circular pasture with a radius of 100 yards. He plans to tie the cow to a post on the circumfrence of the pasture. He wants the cow to be able to eat one third of the grass in the pasture. How long should the rope be?

You must solve a generalization of this problem.

Input

The input begins with a single positive integer on a line by itself indicating the number of the cases following, each of them as described below. This line is followed by a blank line, and there is also a blank line between two consecutive inputs.

Write a program which will input two numbers, R (*radius* — an integer between 1 and 1000 inclusive) and P (*part of* — a real number between 0.0 and 0.5 inclusive) and solve old MacDonald's problem. How long a rope should old MacDonald use to allow the cow to eat P of the grass in the circular pasture of radius R. Express your answer correct to two decimal places.

Output

For each test case, output a statement in the format shown in the sample output below. The number P and the answer shall be rounded to two decimal places. The outputs of two consecutive cases will be separated by a blank line.

Notes:

Recommended value for π is 2*acos(0), but any value within 1e-10 of the exact value of π will lead you to the expected answer.

The value 13.24 in the sample output is purposely not correct. It is included only to show you the correct format

Sample input

```
100 0.33
```

Sample output

```
R = 100, P = 0.33, Rope = 13.24
```