

Problem L: The Tinker's Puzzle

There is an old nursery rhyme that says:

I agreed with a tinker whose name was Doo-little
to make for my aunt a flat-bottomed kettle.

Twelve inches exactly the depth of the same,
and twenty-five gallons of beer to contain.

The inches across at the top would show
just twice the width, as measured below.

So tell me that width, across at the top
for auntie now wants a lid from the shop.



Tell the size of the kettle

Can you indicate the diameter of the required lid to fit on the kettle, which is twelve inches deep, and will hold just twenty-five gallons?

Given the depth of the kettle, and the volume it can hold, calculate its diameter at the top—which is twice the diameter at the bottom. The depth is given in inches, while the volume is given in “beer gallons”, which you should assume to be equivalent to 282 cubic inches.

Input

Input starts with a positive integer T , that denotes the number of test cases.

Each test case contains two integers: D and V which denote the depth and the volume of the kettle, respectively.

$$T \leq 1000 ; 1 \leq D \leq 50 ; 1 \leq V \leq 100$$

Output

For each test case, print the case number, followed by the diameter at the top of the kettle, in inches. Print this as a real number rounded to exactly three digits after the decimal point.

Sample Input	Output for Sample Input
2 12 25 10 33	Case 1: 35.810 Case 2: 45.069