We are dealing with a very well known problem here. A man lives in a hut. On one fine morning he wakes up goes n km to the north, and then he goes n km to the east and then he goes n km to the south to reach his hut again. Your job is to determine the latitude of his hut. You can assume that the man lives on a planet which is a perfect sphere and the man can walk at any location of his planet (no seas, no mountains, no check points, only plain land). If there is more than one solution you just need to find the first 10 smaller solutions. One obvious solution is the south pole. We don't need that.

Input

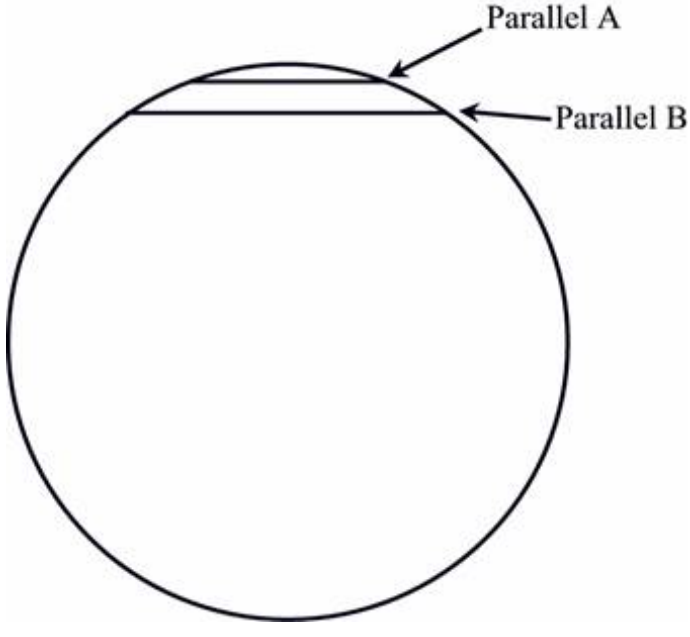
The input file contains several lines of inputs. Each line contains two integers R ($0 < R < 100000$) and n ($R/100 \leq n \leq R/8$). Here R is the radius of earth in km and n is the distance covered in km in each journey as described in the problem statement. Input is terminated by a line where $R = 0$ and $n = 0$.

Output

For each line of input first produce the serial of the output as shown in the sample output. Then produce at most **10** lines, which contain the latitude of the man's house in degree. The degree values should have five digits after the decimal point.

Hint:

Consider a parallel on the northern Hemisphere that has a circumference of n mile (Parallel A in the figure on the right). We can select an arbitrary point on this parallel, move one mile south to another parallel (parallel B in figure on the right). This is a possible position of the man's tent. I mean the mans tent can be anywhere on this parallel. Other such parallel can be found using similar approach.



Sample Input

```
1000 10
1000 20
0 0
```

Sample Output

```
Case 1:
89.33585
89.38145
89.39665
89.40424
89.40880
89.41184
89.41402
89.41564
89.41691
89.41792
Case 2:
88.67171
88.76290
88.79329
88.80849
88.81761
88.82369
88.82803
88.83129
88.83382
88.83585
```