In a billiard table with horizontal side a inches and vertical side b inches, a ball is launched from the middle of the table. After $s > 0$ seconds the ball returns to the point from which it was launched, after having made m bounces off the vertical sides and n bounces off the horizontal sides of the table. Find the launching angle A (measured from the horizontal), which will be between 0 and 90 degrees inclusive, and the initial velocity of the ball.

Assume that the collisions with a side are elastic (no energy loss), and thus the velocity component of the ball parallel to each side remains unchanged. Also, assume the ball has a radius of zero. Remember that, unlike pool tables, billiard tables have no pockets.

Input

Input consists of a sequence of lines, each containing five nonnegative integers separated by whitespace. The five numbers are: a, b, s, m, and n, respectively. All numbers are positive integers not greater than 10000.

Input is terminated by a line containing five zeroes.

Output

For each input line except the last, output a line containing two real numbers (accurate to two decimal places) separated by a single space. The first number is the measure of the angle A in degrees and the second is the velocity of the ball measured in inches per second, according to the description above.

Sample Input

```
100 100 1 1 1
200 100 5 3 4
201 132 48 1900 156
0 0 0 0 0
```

Sample Output

```
45.00 141.42
33.69 144.22
3.09 7967.81
```