Given two positive integers, that represent a rational number as a fraction, we want to produce the decimal periodic representation of the fraction's value. A decimal periodic representation has the following form:

$$d_1 \dots d_i.d_j \dots d_l(d_m \dots d_n)$$

where each d is a decimal digit and the inclusion of $d_m \dots d_n$ between parenthesis means that this sequence of digits is repeated forever. We call $(d_m \dots d_n)$ the periodic part of the representation.

As examples of decimal periodic representations, consider for instance:

$$1/3 = 0.(3) \quad 13/66 = 0.1(96) \qquad 170/12 = 14.1(6) \qquad 24/6 = 4.0$$

Notice that the periodic part is omitted if the decimal expansion of the fraction is finite, as illustrated by the last example.

All fractions can be represented <u>precisely</u>, <u>in a finite way</u>, using this kind of representation. However we cannot give an explicit bound for the size of the periodic part (see for example the second fraction in the sample input below).

Input

The first line contains a non-negative integer n, which is the number of fractions to convert to the decimal periodic representation. The following n lines contain two positive integers, respectively the numerator and the denominator of the fraction to be converted.

Output

For each fraction in the input, there must be a line in the output containing its decimal periodic representation.

Sample Input

```
7
4 33
912 89
120 3
131 909
146 325
12345 88
18 12000
```

Sample Output

```
0.(12)
10.(24719101123595505617977528089887640449438202)
40.0
0.(1441)
0.44(923076)
140.284(09)
0.0015
```