PRIMITIVEROOTS

Problem 4: PRIMITIVEROOTS

Introduction to Primitive Roots:

a **primitive root modulo *n*** is any number *g* with the property that any number coprime to *n* is congruent to a power of *g* modulo *n*.

The number 3 is a primitive root modulo 7. because

$$\begin{array}{rclclclclcll}
3^1 &=& 3 &=& 3^0 \times 3 &\equiv& 1 \times 3 &=& 3 &\equiv& 3 & \pmod 7 \\
3^2 &=& 9 &=& 3^1 \times 3 &\equiv& 3 \times 3 &=& 9 &\equiv& 2 & \pmod 7 \\
3^3 &=& 27 &=& 3^2 \times 3 &\equiv& 2 \times 3 &=& 6 &\equiv& 6 & \pmod 7 \\
3^4 &=& 81 &=& 3^3 \times 3 &\equiv& 6 \times 3 &=& 18 &\equiv& 4 & \pmod 7 \\
3^5 &=& 243 &=& 3^4 \times 3 &\equiv& 4 \times 3 &=& 12 &\equiv& 5 & \pmod 7 \\
3^6 &=& 729 &=& 3^5 \times 3 &\equiv& 5 \times 3 &=& 15 &\equiv& 1 & \pmod 7
\end{array}$$

Problem Statement:

Given a number n as input you've to find the (product all the primitive roots of n) % n if n is prime.

Input:

The first line consists of t the number of test cases followed by t lines. Each line consists of a prime number n.

Output:

For each test case print the test case number followed by ':' followed by (product of all primitive roots of n) % n. If it is not a prime then print "NOTPRIME"

Input Specifications

1<=t<=100

10000>=n>=3

Example

Sample Input

3

6

7

9

Sample Output

1:NOTPRIME

2:1

3:NOTPRIME

Description for test case #2:

The primitive roots of 7 are 3 and 5. The product % 7 = 15%7 =1