Books

Jojo has a lot of books. Sometimes when he is reading a book, he thinks that the book is boring and doesn't want to finish it, so he searches for the other book, of course, if he doesn't want to read a book, he will not read the next volume of this book too. His books are placed in the order such that the next volume of the K-th book is in the (2*k)-th book, for example, the book "algorithm" is the 5th book, then the second volume of "algorithm" is the 10th book, and its third volume is the 20th book. All the books also have a maximum of V volumes, so if V is 3, then there will be no 4th volume of "algorithm", and the 40th book will be a new book. When Jojo feels bored and want to change a book, he will go from the first book to the second to the third, etc, but he will skip all the volume of the book that he already read. If Jojo has N books, and he changes the book M times, find out which book he is reading now.

Format Input
The first line of the input will contain an integer T, the number of test cases.
Each test case will contain two integers, N the number of books he has, and M the number of time he changes book.

Format Output
For each test case, print "Case #X:" (X starts with 1). Then on the same line, print which book Jojo is reading now. If he already finished reading all the book, print -1.

Constraints
1 <= T <= 10
1 <= N <= 100000
1 <= M <= 100000
1 <= V <= 100

Sample Input	Sample Output
3 10 2 3 100 7 3 10 10 3	Case #1: 3 Case #2: 11 Case #3: -1

Explanation:
Case 2:
1 2 3 4 5 6 7 8 9 10 11 12 ... 100

after choosing the first book, the second and fourth book won't be chosen anymore.
1 2 3 4 5 6 7 8 9 10 11 12 ... 100
x x
the next book that can be chosen is the third book, then 6th and 12th book won't be chosen anymore.
1 2 3 4 5 6 7 8 9 10 11 12 ... 100
x x x x
if we continue this, then the 7th chosen book will be 11th book.

1 2 3 4 5 6 7 8 9 10 11 12 ... 100
1 x 2 x 3 x 4 5 6 x 7 x