Our puzzle shows an animated dispute between some miners over their respective claims. It seems that they have obtained "patents" on some mining claims of the same size. Each claim was in the form of a right angled triangle, and all of exactly the same area, but of diferent dimensions, as would be the case with a triangle with a base of 35 feet, an elevation of 12 and the hypotenuse of 37, as compared with another with dimensions of 20, 21 and 29, as both contain areas of 210 feet. The puzzle calls for the complete list of diferent triangles with an area of 210 square feet, taking into account that all triangles must have a square angle, and the lengths of their sides must be integers.
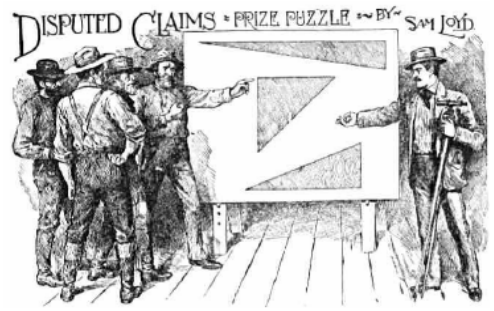
The miners and their claims

Your task now is to identify all possible triangles (right-angled and with sides of integer lengths, as in the puzzle) with a certain area A. Print the lengths of each triangle in ascending order, and the whole list of triangles in ascending order as well—sort the triangles frst by their frst (shortest) side, then the second side and fnally by their longest side.

Input

Input starts with a positive integer T, that denotes the number of test cases. Each test is described by a single integer A, in a line of its own.

$T \leq 10^4$; $1 \leq A \leq 10^7$

Output

For each test case, print the case number, followed by the number of valid triangles with area A. Then print the sorted list of these triangles, one per line, using the format (a, b, c), where a, b, c are the lengths of the sides of the triangle, in ascending order.

Sample Input

```
4
210
1000
2400
3360
```

Sample Output

```
Case 1: 2
(12,35,37)
(20,21,29)
Case 2: 0
Case 3: 1
(60,80,100)
Case 4: 3
(30,224,226)
(48,140,148)
(80,84,116)
```