

## 4280 Pencils from the Nineteenth Century

The program “Sunday Week-end Edition” on the US National Public Radio (NPR) network has a “Sunday Puzzle” segment. The show that aired on Sunday, June 29, 2008 presented the following puzzle:

From a nineteenth century trade card advertising Bassett’s Horehound Troches, a remedy for coughs and colds: A man buys 20 pencils for 20 cents and gets three kinds of pencils in return. Some of the pencils cost 4 cents each, some are two for a penny and the rest are four for a penny. How many pencils of each type does the man get?

A clarification provided to the problem indicated that correct solutions would contain at least one of each pencil type.

This is an enhancement of the problem that originally aired on the NPR show. Rather than just considering 20 pencils for 20 cents, consider the case of  $N$  pencils for  $N$  cents. Given a value of  $N$ , determine if a solution is possible, and if so, determine all possible solutions.

### Input

Each input line, except the last, contains a value of  $N$  in the range 1 to 256 for which the problem is to be solved. The last input line contains the integer ‘0’.

### Output

For each value of  $N$  in the input, display the case number (1, 2, ...) and the phrase ‘ $N$  pencils for  $N$  cents’ as shown in the sample output below. If there are no solutions for a particular value of  $N$ , then display the line ‘No solution found.’

If there are solutions, display three lines for each one, separating the groups of three lines for each solution by a blank line. Order these solutions by increasing numbers of four-cent pencils. Display a blank line after the output for each case.

### Sample Input

```
10
20
40
0
```

### Sample Output

```
Case 1: 10 pencils for 10 cents
No solution found.
```

```
Case 2: 20 pencils for 20 cents
3 at four cents each
15 at two for a penny
2 at four for a penny
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Case 3: 40 pencils for 40 cents

6 at four cents each

30 at two for a penny

4 at four for a penny

7 at four cents each

15 at two for a penny

18 at four for a penny