

Ramen Noodles - Brock

The Letters

First, here is the value of each letter:

- I = 1 (one)
- V = 5 (five)
- X = 10 (ten)
- L = 50 (fifty)
- C = 100 (one hundred)
- D = 500 (five hundred)
- M = 1000 (one thousand)

The Rules

- I. The letters should be arranged from the one with the largest value to the one with the smallest. Each letter's value is added to the previous ones.
- II. Only powers of ten (I, X, C, M) can be repeated. Do not repeat any letter more than three times in a row.
- III. Because of the preceding rule, certain numbers must be written using subtraction. In this case, a letter with a smaller value precedes one with a larger value and the value of the smaller is subtracted from the larger. The result is then added to the rest of the letters. The following rules apply to subtraction:
 - i. Only powers of ten (I, X, C, M) can be subtracted.
 - ii. If another letter follows the larger one, it must be smaller than the number preceding the larger one.

Examples for Each Rule

- I. 1510 is written MDX, not XDM or DXM or other combinations.
- II. 100 is not written LL (not a power of ten) or XXXXXXXXXXXX (too many repeated Xs).
- III. CCXLIII = $100 + 100 + (50 - 10) + 1 + 1 + 1 = 243$.
800 isn't CCM because you can only subtract one letter from another, not two.
 - i. 45 isn't VL because V (5) isn't a power of ten.
 - ii. 99 isn't IC because I (1) is 1/100th of C (100), not 1/10th.
49 isn't IL because I (1) is 1/50th of L (50), not 1/5th.
 - iii. 1400 isn't DCM because D (500) is less than 1000 ($10 * 100$ (C)).
 - iv. 140 isn't XCL because L (50) isn't smaller than X (10).
100 isn't XCX because X (10) isn't smaller than itself.

In Plain English

Think of each combination of letters of equal powers of ten as one digit. For example, in CCCLXII (362), CCC (300) is the hundreds, LX (60) is the tens, and II (2) is the ones.

Subtraction only takes place for four and nine times a power of ten (i.e. 4, 40, 400, 9, 90, 900). This is to avoid more than three of the same letter in a row. It is written by putting a smaller value in front of a larger one. So 4 is IV, not IIII. And 900 is CM, not DCCCC.

This complicates the first statement of this section some because there might be a higher power of ten in a lower power of tens section. For example, in MCMIX (1909), M (1000) is the thousands, CM (1000 - 100 = 900) is the hundreds, and IX (10 - 1 = 9) is the ones.

To put it most concisely: When converting to Roman numerals, convert each digit separately. For example, for 953 convert 900, 50, and 3 to give CM, L, and III to get CMLIII.