4514 Nbits

How many different integers between A and B (including A and B) have exactly N bits of 1 in the two's complement representation? That's the question to be answered in this problem.

Example

The problem is pretty clear. For example, suppose A is 5, B is 14, and N is 2. If we look at the two's complement binary representation of the integers between 5 and 14 and identify those with exactly 2 one bits, we find that there are five such numbers (identified by the left-pointing arrows. All the high-order bits in these numbers are 0; they are not shown for clarity.)

5	0101	←	10	1010	←
6	0110	←	11	1011	
7	0111		12	1100	←
8	1000		13	1101	
9	1001	←	14	1110	

So the answer for this case would be 5.

Input

There will be multiple input cases to consider. For each case there will be a single input line containing A, B, and N. The input for the last case will be followed by a line containing three zeroes. A and B will each be in the range -2147483648 to +2147483647, and N will be in the range 1 to 32.

Output

For each input case, display the case number $(1, 2, \ldots)$ and the appropriate number. Display a blank line after the output for each case. The sample input and output illustrate the appropriate formats.

Sample Input

```
5 14 2
5 14 3
-1 1 1
0 0 0
```

Sample Output

```
Case 1: 5 numbers

Case 2: 4 numbers

Case 3: 1 numbers
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