Problem 84: Piecewise Encrypter

Difficulty: Medium

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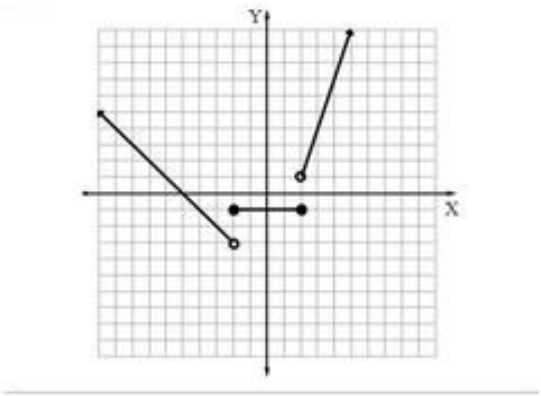
Problem Background

In math, a piecewise function is defined by multiple sub-functions, with each sub function applying to different input values. Your task today is to create a piecewise encrypter!



Problem Description

You were asked to create a program to encrypt a piece of text. You will be given a set of alphabetic letters to encode. Each alphabetic letter will be encoded by first being translated into a number as follow:

$$f(x) = \begin{cases} -x - 5 & \text{if } x \le -2 \\ 3 & \text{if } -2 < x < 6 \\ x-6 & \text{if } x \ge 6 \end{cases}$$

A=1, B=2, C=3, . . . , X=24, Y=25, Z=26

Once each letter has been converted into a number, it must be modified according to the rules in the table below.

If the letter falls within this range:	Use this encoding rule:
A – E	Add 6 to its numerical value.
F – J	Square its numerical value.
K – O	Divide its numerical value by 3. Multiply the integer remainder by 5 and add 1.
P – T	Multiply the sum of the digits of its numerical value by 8.
U- Z	Find the largest integer factor of its numerical value less than the value itself. Multiply it by 2.

Once you get the result of applying the numeric encoding rule, convert the numerical value back to an alphabetic letter to use in your output. For example, 7 would be converted into G. If the result of the rule is greater than 26, divide the number by 26 and use the remainder to determine which letter it corresponds to. For example, 27 will be encoded as A and 28 will be encoded as B. If the result of encoding calculation is 0, the original character will be used.

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include:

- A single line of text to encode!

```
2
HELLO
WORLD
```

Sample Output

For each test case, your program should output one line containing the encrypted text.

```
LKAAA
BATAJ
```