Problem 8 - Highly Recursive Function

Professor Plums likes recursion, but his students typically find it confusing. During a recent faculty meeting his mind wandered, and he invented the following recursive mathematical function, $H(n)$:

$$H(n) = H(n+5) + H(n+4) + H(n+2) \qquad \text{for all values of } n \leq -8$$
$$H(n) = n \qquad \text{for all values of } -8 < n < 10$$
$$H(n) = H(n-8) + H(n-5) + H(n-3) \qquad \text{for all values of } n \geq 10$$

He wants you to write a program to compute values of the function $H(n)$.

Input

The first line contains the number of n values to run through the function $H(n)$. Each of the following lines contain a single integer value of n. All of the values of n and corresponding $H(n)$ values will fit into a 64-bit signed integer. The below sample input contains three n values.

```
4
-8
10
-13
-4
```

Output

For each n value, print to standard output a case label and the value of $H(n)$ as defined above. For the example input given above, the output is:

```
Case 1: H(-8) = -13
Case 2: H(10) = 14
Case 3: H(-13) = -58
Case 4: H(-4) = -4
```