



ACM International Collegiate Programming Contest 1999 Greater New York Regional

Problem E – Polish Calculator

The Problem

In Polish mathematical notation, an expression consists of either a number or an operator followed by its operands. Each operand is itself an expression, which is fully evaluated before the entire expression can be evaluated. For example, consider the following expressions in standard notation:

```
5 * 2 + -3
5 * (2 + -3)
5 + ((-4 * -5) + ((5 + (6 - 2)) * 7) + ((4 + 2) * (3 - 1)))
```

The Polish notation equivalents of these expressions, respectively, are as follows:

```
+ * 5 2 -3
* 5 + 2 -3
+ 5 + * -4 -5 + * + 5 - 6 2 7 * + 4 2 - 3 1
```

The usefulness of Polish notation in calculation is that it does not require parentheses because the order of operations is unambiguous. This problem requires that you write a program to evaluate expressions in Polish notation.

Input / Output Specification

The first line of input will contain the number of problems to follow in the input file, one per line. Each problem will be an expression in Polish notation of not more than 80 characters in length. Each expression will consist of only integers in the range $(-10000 \leq N \leq 10000)$ and the binary operators $+$, $-$, and $*$. The value of any expression or subexpression will be in the range $(-1000000 \leq E \leq 1000000)$. There will be at least one space before any number. White space is optional before operators. (Unary minus signs should be considered to be part of the integer values, not operators, and will not be separated from the values they modify by any white space.)

For each expression, output the integral value of the expression, one per line.

Sample Input

```
5
+ * 5 2 -3
* 5 + 2 -3
+ 5+* -4 -5+*+ 5- 6 2 7*+ 4 2- 3 1
+ * - + 24 5 29 5 -7
* 0 0
```



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Sample Output

```
7
-5
100
-7
0
```