Simplify the Algebraic Expressions

A simplified algebraic expression is an expression which has been reduced to a simpler, more compact form *without changing the expression's value*. To a great extent, this largely involves collecting and combining 'like' terms.

For example:

- $x^2 + 2x + 2x^2 + 2 + 4x + 6$ can be simplified to $3x^2 + 6x + 8$.
- $5x + 2(x-4)$ can be simplified to $7x - 8$
- $5x \times (2 + 3^2) + 51 \times \frac{(x-4)}{(5+6\times2)}$ reduces to $5x \times 11 + 3 \times (x - 4)$, which reduces to $58x - 12$

Task
Given an algebraic expression, reduce the expression to a simplified form meeting the following criteria:

- All terms are in *descending* order of the power of variable x.
- Coefficients should be concatenated immediately to the left of your variable (e.g.: $5 \times x$ should be printed as `5x`).
- There are exactly 3 characters between any 2 consecutive terms of the expression: a space, followed by a $+$ or $-$ sign, followed by another space.
- In case there is no operator between expressions, assume that it implies multiplication. e.g. `(5x+2)(x+2)` should be treated as `(5x+2)*(x+2)`, `5(x+1)` should be treated as `5*(x+1)`.
- The simplified expression must not contain any parentheses.
- 1-coefficients and 1-powers are implied; if the coefficient or power of a certain x term is 1, do not output 1 (e.g.: $1x$ or $1 \times x$ simplifies to x, and x^1 simplifies to x).
- Do not print the powers of x having a coefficient of 0 (e.g.: output `5x^2 - 3`, *not* `5x^2 + 0x - 3`).

Input Format

The first line contains an integer, T, denoting the number of test cases.
The T subsequent lines of test cases each contain an expression that you must reduce.

Constraints

- $1 \leq T \leq 10$
- Each expression will only use a single variable, x, and may contain parentheses (`(`, `)`), addition (`+`), subtraction (`-`), multiplication (`*`), division (`/`), and exponentiation (`^`) symbols. The role of exponentation symbols will be limited to representing powers of x or integers. You will not encounter terms such as $(x - 5)^2$. You may encounter terms like 3^(1+4) and so on.
- There may be one or more spaces between any consecutive terms, operators, or operands (so you must account for and remove these in your code).
- No divisor will contain a term involving x, and all divisors are integers.
- All coefficients in the final expression are integers (e.g.: $5x^2, 4x, x$). You will not encounter something

like $2.5x$ or $1.25x^2$.

- There may be multiple levels of nested parentheses.
- The original expression will not contain more than 100 characters (including spaces).
- The expression will not evaluate to a polynomial of an order higher than 5.
- You will not encounter an integer exeeding 1000 either while parsing the original expression or in the final coefficients of your simplified expressions.
- Expressions not containing a variable (x) simply require you to calculate the expression's result.

Output Format

For each test case, print the simplified expression on a new line. Your reduced expression should meet the criteria set forth in the *Problem Statement* above.

Sample Input

```
6
10x + 2x - (3x + 6)/3
18*(2x+2) - 5
((9x + 81)/3 + 27)/3  - 2x
18x + (12x + 10)*(2x+4)/2 - 5x
(2x+5) * (x*(9x + 81)/3 + 27)/(1+1+1)  - 2x
(2x+5) * (x*(9x^3 + 81)/3 + 27)/(1+1+1)  - 2x
```

Sample Output

```
11x - 2
36x + 31
-x + 18
12x^2 + 47x + 20
2x^3 + 23x^2 + 61x + 45
2x^5 + 5x^4 + 18x^2 + 61x + 45
```

Explanation

Observe that the original expressions have been expanded and their like terms collected, thus resulting in the printed simplified expressions.