Plotting functions

Given a function y=f(x) plot it with stars (*) and then (!) its derivation with crosses (+) for 0<=x<=20 with Δx=1 in a diagram with 21*21 points (0<=x,y<=20). Empty fields are marked with dots (.). For plotting the real number y should be rounded to integer (-0.5 -> -1, -0.4 -> 0, 0.4 -> 0, 0.5 -> 1).
The function and its derivation are continuous between 0 and 20.
The function definition uses only the following characters: 0123456789x.+-*/()
'**' means 'power of'.

See also this similar task.

Input

In the first line the number N of functions, then N lines with one function.

Output

The plot of each function and its derivation in 21 lines.

Example

Input:

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2
x
20/(x+1)
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Output:

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