DERIVATIVES:

$d(\text{constant}) = 0.0$

$d(\text{different variable}) = 0.0$

$d(x) = 1.0$ (when differentiating w.r.t. x)

$d(A \pm B) = d(A) \pm d(B)$

$d(A \times B) = d(A) \times B + A \times d(B)$

$d(\frac{A}{B}) = \frac{(d(A) \times B) - (A \times d(B)}{B^2}, B \neq 0$

$d(A(B)) = A'(B) \times B'$ (A' is the first derivative of A)

$d(A^n) = nA^{n-1} \times d(A), n \in \mathbb{Z}$

$d(\ln A) = \frac{d(A)}{A}$

$d(A^B) = A^B \times ((d(B) \times \ln A) + (B \times d(\ln A)))$

$d(\sin A) = \cos A \times d(A)$

$d(\cos A) = -\sin A \times d(A)$

$d(\tan A) = (\sec A)^2 \times d(A)$

$d(\sec A) = \sec A \times \tan A \times d(A)$

$d(\csc A) = -\csc A \times \cot A \times d(A)$

$d(\cot A) = -(\csc A)^2$

where A, B are some functions.

IDENTITIES:

$a \pm 0 = a$

$0 + a = a$

$a \times 0 = 0 \times a = 0$

$a \times 1 = 1 \times a = a$

$\frac{0}{a} = 0, a \neq 0$

$\frac{a}{1} = a$

$0^a = 0$

$1^a = 1$

$a^0 = 1$
$a^1 = a$
$\ln 1 = 0$
$\sin 0 = \tan 0 = 0$
$\cos 0 = \sec 0 = 1$
$\csc 0, \cot 0$ (Not Defined)

INPUT:
Input should be fully parenthesised consisting of either binary operators or some specific functions, without extra spaces. The functions are recognised by a " ", i.e., `(sin x)` (but not `(sinx)`, `(sin(x))`, `(sin (x))`, `(sin  x` or any other combinations) represents $\sin x$. Also, numbers should be entered as X.0 (instead of X), for example `2019.0` (instead of `2019`)

Some accepted inputs:
```
(x^2.0)
(0.0-x)
((x+4.0)^(x*(x^2.0)))
(sin (x^2.0))
((sin x)^2.0)
```

Some invalid inputs
```
x^2              > (x^2.0)
(-x)             > (0.0-x)
(3x)             > (3.0*x)
(x*x*3.0)        > (x*(x*3.0)) or ((x*x)*3.0)
(1/x)            > (1.0/x)
(sin x^2.0)      > (sin (x^2.0)) or ((sin x)^2.0)
```