

Q1)

1.1) CFG used

$$\begin{aligned}
 \text{answer} &\rightarrow \text{exp} \\
 \text{exp} &\rightarrow \text{exp} - \text{exps} \mid \text{exps} \\
 \text{exps} &\rightarrow \text{exps} + \text{expa} \mid \text{expa} \\
 \text{expa} &\rightarrow \text{expa} * \text{expm} \mid \text{expm} \\
 \text{expm} &\rightarrow \text{expm} / \text{expd} \mid \text{expd} \\
 \text{expd} &\rightarrow (\text{exp}) \mid \text{number}
 \end{aligned}$$

1.2) Attributes:

$\text{answer} \rightarrow \text{exp}$	$\{\text{answer.flt} \uparrow := \text{exp.flt} \uparrow\}$
$\text{exp} \rightarrow \text{exp} - \text{exps}$	$\{\text{exp.flt} \uparrow := \text{exp.flt} \uparrow - \text{exps.flt} \uparrow\}$
$\text{exp} \rightarrow \text{exps}$	$\{\text{exp.flt} \uparrow := \text{exps.flt} \uparrow\}$
$\text{exps} \rightarrow \text{exps} + \text{expa}$	$\{\text{exps.flt} \uparrow := \text{exps.flt} \uparrow + \text{expa.flt} \uparrow\}$
$\text{exps} \rightarrow \text{expa}$	$\{\text{exps.flt} \uparrow := \text{expa.flt} \uparrow\}$
$\text{expa} \rightarrow \text{expa} * \text{expm}$	$\{\text{expa.flt} \uparrow := \text{expa.flt} \uparrow * \text{expm.flt} \uparrow\}$
$\text{expa} \rightarrow \text{expm}$	$\{\text{expa.flt} \uparrow := \text{expm.flt} \uparrow\}$
$\text{expm} \rightarrow \text{expm} / \text{expd}$	$\{\text{expm.flt} \uparrow := \text{expm.flt} \uparrow / \text{expd.flt} \uparrow\}$
$\text{expm} \rightarrow \text{expd}$	$\{\text{expm.flt} \uparrow := \text{expd.flt} \uparrow\}$
$\text{expd} \rightarrow (\text{exp})$	$\{\text{expd.flt} \uparrow := \text{exp.flt} \uparrow\}$
$\text{expd} \rightarrow \text{number}$	$\{\text{expd.flt} \uparrow := \text{atoi}(\text{ytext})\}$

example: $10 + (20 - 1.5 / (24 / 6))$

