For Log:

$$\begin{aligned}
\left(f'(x)-\frac{1}{x}\right) &\equiv \epsilon \\
f(x) &= (x-1)\,\eta(x) \\
f'(x) &= \eta(x)+(x-1)\,\eta'(x) \\
\delta\left[\epsilon^2\right] &= 2\left(\eta(x)+(x-1)\,\eta'(x)-\frac{1}{x}\right)(\delta\eta(x)+(x-1)\,\delta\eta'(x)) \\
\delta\left[\epsilon^2\right] &= 2\left[O1(x)+(x-1)\,OD1(x)-\frac{1}{x}\right][\delta O1(x)+(x-1)\,\delta OD1(x)] \\
DO1(x) &= 2\left[O1(x)+(x-1)\,OD1(x)-\frac{1}{x}\right] \\
DOD1(x) &= 2(x-1)\left[O1(x)+(x-1)\,OD1(x)-\frac{1}{x}\right]
\end{aligned}$$