

bch(u,sv)

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$$\text{bch}(u, (s+\epsilon)v) = \text{bch}(\text{bch}(u, sv), \epsilon v)$$

$$e^{x+\epsilon y} = e^x + \epsilon e^x \cdot \frac{e^{\text{ad}_x} - 1}{\text{ad}_x}(y) \quad \text{so} \quad (\text{mod } \epsilon^2 = 0)$$

if $x + \epsilon y$

$$\frac{d}{ds} \text{bch}(u, sv) = \frac{d}{d\epsilon} \text{bch}(\text{bch}(u, sv), \epsilon v) \Big|_{\epsilon=0}$$

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