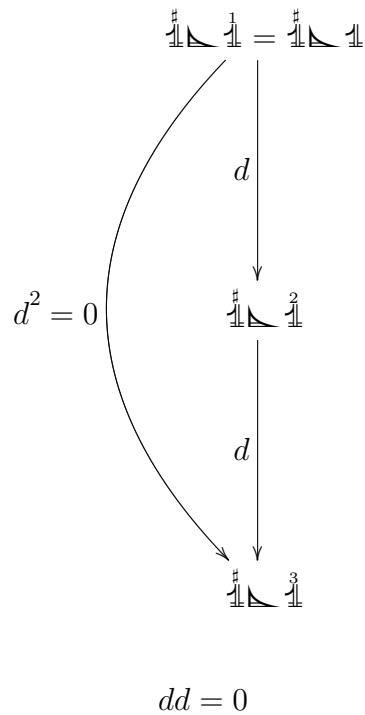




$$\begin{aligned}
 d \overbrace{d \begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x}_j \mathbf{1}} &= d \overbrace{\begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x} \mathbf{1}^j - \mathbf{1}^j \mathbf{x} \mathbf{1} \mathbf{x} \begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x}_j \mathbf{1} - \mathbf{x}_j \mathbf{1} \mathbf{x} \mathbf{1}} \\
 &= \overbrace{d \begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x} \mathbf{1}^j - \mathbf{1}^j \mathbf{x} \mathbf{1}}^{=0} \mathbf{x} \begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x}_j \mathbf{1} - \mathbf{x}_j \mathbf{1} \mathbf{x} \mathbf{1} + \begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x} \mathbf{1}^j - \mathbf{1}^j \mathbf{x} \mathbf{1} \mathbf{x} \overbrace{d \begin{array}{c} \diagup \\ \diagdown \end{array} \mathbf{x}_j \mathbf{1} - \mathbf{x}_j \mathbf{1} \mathbf{x} \mathbf{1}}^{=0} = 0
 \end{aligned}$$