

$$\overbrace{d \cancel{\Delta}^g \times 1 + 1 \times \cancel{d}} = \cancel{d \Delta^g} \times 1 + 1 \times \cancel{d \Delta}$$

$$\begin{aligned}
& \underbrace{d \cancel{\Delta}^g \times 1 + 1 \times \cancel{d}}_{\text{left}} = \underbrace{\cancel{\Delta}^g \times 1 + 1 \times \cancel{d}}_{\text{middle}} \times \underbrace{\cancel{\Delta}^g \times 1 + 1 \times \cancel{d}}_{\text{right}} - \underbrace{\cancel{\Delta}^g \times 1 + 1 \times \cancel{d}}_{\text{middle right}} = \\
& \quad \cancel{\Delta}^g \times 1 + 1 \times \cancel{d} \times \cancel{\Delta}^g \times 1 + 1 \times \cancel{d} - \cancel{\Delta}^g \times 1 - 1 \times \cancel{d} = \\
& \quad \cancel{\Delta}^g \times \cancel{\Delta}^g \times 1 - \cancel{\Delta}^g \times 1 + 1 \times \cancel{d} \times \cancel{\Delta}^g - 1 \times \cancel{d} + \\
& \quad \cancel{\Delta}^g \times \cancel{\Delta}^g + \cancel{\Delta}^g \times \cancel{d} - \cancel{\Delta}^g \times \cancel{d} - \cancel{\Delta}^g \times \cancel{d} = \underbrace{\cancel{d \Delta^g}}_{\text{right}} \times 1 + 1 \times \cancel{d \Delta}_{\text{right}}
\end{aligned}$$