

$$\mathbf{sum} = v_1'(1+\eta_N)+v_2'(1+\eta_{N-1})+\cdots+v_n'(1+\eta_1) = v_1(1+\eta_{N+1})+v_2(1+\eta_N)+\cdots+v_N(1+\eta_2) = (a_1+\alpha_1)(1+\eta_{N+1})+(a_2+\alpha_2)(1+\eta_N)+\cdots+(a_N+\alpha_N)(1+\eta_2)$$