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Abstract

We present one main result, the **Factorization Theorem,** which unifies several identities that exhibit factorizations of $\sum_{j=i}^{n+i-1} F_{aj-b}$. We introduce a unified proof method based on formulae for the factorization of $F_{q-d} + F_{q+d}$. One of the factors of $\sum_{j=i}^{n+i-1} F_{aj-b}$ is a member of the second order recursive sequence whose members are $\{G_1 + G_a + G_{2a} + ...\}$ or (for a even) $\{G_{\frac{a}{2}} + G_{\frac{3a}{2}} + G_{\frac{5a}{2}} + ...\}$, with G equal L or F. It is shown that, for a even, these sequences obey the same recursions as the sequences $\{G_{na}\}$.