from which we get that

$$W_n = (L_{2n} - 2)/n$$

or

$$L_{2n} - 2 = \sum_{\gamma(n)} \frac{(-1)^{k-1}n}{k} F_{2a_1} \cdots F_{2a_k} .$$

These properties have been generalized elsewhere for arbitrary order recurrence relations [5].

Hoggatt and Lind [3] have also developed similar results in an earlier paper.

The author would like to thank Dr. A. J. W. Hilton of the University of Reading, England, for suggesting the problem.

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EMBEDDING A GROUP IN THE p^{th} POWERS

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In a finite group G, the set of squares, cubes, or p^{th} powers in general, does not necessarily constitute a subgroup. However, we can always embed a finite group into the set of squares, cubes, or any p^{th} powers of another group.

A subgroup H of a group G is said to be a *subgroup of* p^{th} *powers* if for every $y \in H$, there is an $x \in G$ such that $x^p = y$.

Theorem. Every finite group G is isomorphic to a subgroup of p^{th} powers of some permutation group.

Proof. Let G be a finite group, and let P be an isomorphic permutation group on n elements, say $a_{11}, a_{12}, \cdots, a_{1n}$.

Consider a permutation group Q on pn elements

$$a_{11}, a_{12}, \cdots, a_{1n};\quad a_{21}, a_{22}, \cdots, a_{2n};\quad \cdots,\quad a_{p1}, a_{p2}, \cdots, a_{pn},$$

defined in the following manner: For any permutation

$$\sigma = (a_{1i_1}a_{1i_2} \cdots a_{1i_k}) \cdots (a_{1j_1}a_{1j_2} \cdots a_{1j_m})$$

in P corresponds the permutation

$$\begin{aligned}\hat{\sigma} = {} & (a_{1i_1}a_{1i_2} \cdots a_{1i_k})(a_{2i_1}a_{2i_2} \cdots a_{2i_n}) \cdots (a_{pi_1}a_{pi_2} \cdots a_{pi_k}) \\ & \cdots (a_{1j_1}a_{1j_2} \cdots a_{1j_m})(a_{2j_2} \cdots a_{2j_m}) \cdots (a_{pj_1}a_{pj_2} \cdots a_{pj_m})\end{aligned}$$

in the symmetric group S_{pn}. Q is clearly isomorphic to P and each elemenr in Q is the p^{th} power of an element in S_{pn}. In fact, $\hat{\sigma} = \tau^p$, where

$$\begin{aligned}\tau = {} & (a_{1i_1}a_{2i_1} \cdots a_{pi_1}a_{1i_2}a_{2i_2} \cdots a_{pi_2} \cdots a_{1i_k}a_{2i_k} \cdots a_{pi_k}) \\ & \cdots (a_{1j_1}a_{2j_1} \cdots a_{pj_1}a_{1j_2}a_{2j_2} \cdots a_{pj_2} \cdots a_{1j_m}a_{2j_m} \cdots a_{pj_m}).\end{aligned}$$

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