Langford Pairings SHOWN USING A FORMULA!!!

In combinatorial mathematics, a Langford pairing is a permutation of the sequence of 2n numbers 1, 1, 2, 2, ..., n, n in which the two ones are one unit apart, the two twos are two units apart, etc.They are named after C. Dudley Langford who proposed the problem of constructing them in 1958. NO ONE had success in counting the number of possible Landford "pairs" for certain 'n' other than using brute force on a computer, and we have proved which 'n's held true for making each pairing and could produce a singleton for each 'n' elements in a set such that n mod 4 $\equiv -1, 0$; however, EVERY paper stated that there was !!NO KNOWN FORMULA!!

$$L(2,3) = \frac{[\binom{6}{2}-3^2\cancel{-1^2}\cancel{+1}][\binom{4}{2}-2^2\cancel{-1^2}\cancel{+1}][\binom{2}{2}\cancel{-1^2}\cancel{+1}]}{1!*3!} = \frac{[15-9][6-4][1-0]}{1!*3!} = \frac{\cancel{6}*2}{\cancel{6}} = 2,$$

$$L(2,4) = \frac{[\binom{8}{2}-4^2-2^2\cancel{-1^2}\cancel{+1}][\binom{6}{2}-3^2\cancel{-1^2}\cancel{+1}][\binom{4}{2}-2^2\cancel{-1^2}\cancel{+1}][\binom{2}{2}\cancel{-1^2}\cancel{+1}]}{2!*4!} = \frac{[28-20][15-9][6-4][1-0]}{2!*4!} = \frac{\cancel{8}*\cancel{6}*2*1}{\cancel{2}*\cancel{8}*\cancel{3}} = 2,$$

$$L(2,7) = 2*\frac{[\binom{14}{2}-7^2\cancel{-1^2}\cancel{+1}][\binom{12}{2}-6^2-2^2\cancel{-1^2}\cancel{+1}][\binom{10}{2}-5^2\cancel{-1^2}\cancel{+1}][\binom{8}{2}-4^2\cancel{-1^2}\cancel{+1}][\binom{6}{2}-3^2\cancel{-1^2}\cancel{+1}][\binom{4}{2}-2^2\cancel{-1^2}\cancel{+1}][\binom{2}{2}\cancel{-1^2}\cancel{+1}]}{4!*7!} =$$

$$= 2*\frac{42*26*20*12*6*2*1}{4*3*2*1*7*6*5*4*3*2*1} = 52;$$

$$L(2,8) = 2*\frac{[\binom{16}{2}-6^2\cancel{-1^2}\cancel{+1}][\binom{14}{2}-4^2\cancel{-1^2}\cancel{+1}][\binom{12}{2}-5^2-3^2\cancel{-1^2}\cancel{+1}][\binom{10}{2}-4^2-2^2\cancel{-1^2}\cancel{+1}][\binom{8}{2}-4^2\cancel{-1^2}\cancel{+1}][\binom{6}{2}-3^2\cancel{-1^2}\cancel{+1}][\binom{4}{2}-2^2\cancel{-1^2}\cancel{+1}][\binom{2}{2}\cancel{-1^2}\cancel{+1}]}{5!*8!} =$$

$$= 2*\frac{84*75*32**25*12*6*2*1}{5*4*3*2*1*8*7*6*5*4*3*2*1} = 300;$$

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