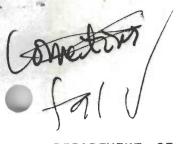
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-DEPARTMENT__OE__MATHEMATICS-

N.J.A. Sloane
Math. Research Center
Bell Telephone Laboratories, Inc.
Murray Hill, New Jersey

→ 6342 -6343 5043

Dear Sir:

I own and thoroughly enjoy your handbook of integer sequences. May I be put on the list of those interested in supplements or updates?

The major monograph of Birkhoff and Lewis (1946) on Chromatic Polynomials in the AMS Transactions contains three important sequences, only one of which was thoroughly understood until recently. I enclose a short description, giving the references, the explanation of the sequences, and the formulas that have been found. I also mention a closely related sequence of the sequence B&L do have a formula for. This sequence of numbers is very important for the reducibility phase of the solution of the Four Color Problem.

I also have a slight correction to make . Your sequence #942 is the dissections of an ** ** n-sided polygon into n-2 triangles. ** Here, isomorphism types of these are desired, the effects of dihedral symmetry must be canceled. Without canceling the symmetries (using labeled polygons) it is of course the Catalan sequence #577.

Your sequence *1325 is quoted from the Oakley/Wisner article in the Math. Monthly on flexagons. It turns out that each abstract flexagon of order n is uniquely correlated with an isomorphism type of a triangulated polygon! This fact is not my own discovery (although I rediscovered it), but can for instance be found in an unpublished mammoth manuscript by Conrad & Hartline (while at RIAS in Baltimore) and also the access*ble:

Sidney H. Scott, How to construct hexaflexagons, Recreational Math. Magazine, Dec. 1962.

Hence it ought to be sequence #942, not #1325 for flexagons.

The error seems to belong to Oakley and Wisner: they rotated the dissected polygon, and removed those symmetries, but didn't reflect it, and also didn't make any statement about their choice. I suggest that #1325 be retained with new caption "one-sided dissections of polygons" or "dissections without reflection of polygons" with maybe a similar qualification for flexagon -- although this would be quite arbitrary for the latter, since the mirror image of a flexagon map is a map of the same flexagon, whether or not the flexagon is turned over.

Oh yes, the chromatic sequences if interpolated in the present catalog would be 1023.x, 1375.x, and 1385.x. I also see Ron Graham betimes at Waterloo, and other combinatorics conferences.

Sincerely, FRank R. Bernhart

(63)



Bell Laboratories

600 Mountain Avenue Murray Hill, New Jersey 07974 Phone (201) 582-3000

October 17, 1977

Professor Frank R. Bernhart Mathematics Department Bloomsburg State College 360 East Third Street Bloomsburg, Pennsylvania 17815

Dear Professor Bernhart:

Thank you very much indeed for your letter. I enclose a copy of Supplement I, the only one issued so far (another is long overdue). Also a couple of other things that may amuse you.

Thank you for the three new sequences of chromatic numbers, and the comments on 942 and 1325. These will all go into the second edition, along with a great pile of other new material. (What I need is an aide-de-camp.)

It was very kind of you to write. With all good wishes.

Yours sincerely,

MH-1216-NJAS-mv

N. J. A. Sloane

Enc.

As above