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R K Guy  
Letter

1 page

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88-12-05

Dr. Neil J.A. Sloane,  
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Dear Neil,

You have sequences (1), 2, 5, 16, 65 and  
(1), 2, 5, 16, 67, but not (1), 2, 5, 16, 66. Frank Schmidt  
sends me a problem, which he thinks is due to Richard Stanley.

$M_n$  is the  $n \times n$  matrix whose  $(i, j)$  entry is  $\binom{i}{j}$ . Form the sum  
of all determinants of minors of  $M_n$  (including the empty one,  
which contributes 1), i.e.  $\binom{n}{0}^2 + \binom{n}{1}^2 + \dots + \binom{n}{n}^2$  of them,  
say  $F(n)$  ( $F(0) = 1$ ),  $F(1) = 2$ ,  $F(2) = 5$ ,  $F(3) = 16$ ,  $F(4) = 66$ , ...

Define  $G(n)$  as the product of  $(i+j+k-1)/(i+j+k-2)$ , taken over  
all  $1 \leq i \leq j \leq k \leq n$ . Conjectures: 1.  $G(n)$  is an integer,  
2.  $G(n) = F(n)$ .

Do you know anything about this? Pass it on to  
JHC: he might be interested.

Best wishes for 1989.

Yours sincerely,

*Richard*

Richard K. Guy.

RKG:l