28 MAY 75 6516

f91 **Mathematical Gems** by Ross Honsberger (1973 Math. assocⁿ of America) given to me by Martin Gardner, has some series not included in the supplement — 6522

Math Gems page				
113	✓	PRACTICAL NUMBERS (A. K. SRINIVASAN) Series 1741·5	k is the sum of distinct proper divisors of n for all k ≤ n. (1), 6, 28, 120, 496, ... $2^{n-1}(2^n-1)$	6516
139	Omit ✓	D-numbers (D. C. Morrow, 1951) Series 1962·5	$n \mid a^{n-2} - a$. See also Sierpinski. (1) 9, 15, 21, 33, 39, ... 195, ... (Not listed in extenso, unfortunately)	✗
142		$n \mid 2^n + 2$ Series 681·5	(1), 2, $6 = 2^2+2$, $66 = 2^6+2$, $2^{66}+2$, ... $u_{n+1} = 2^{u_n}+2$ ← errors 171	6517
"	✓	$n \mid 2^n + 1$ Series 1128·5	1, 3, 9, 27, 81, 243, 513 ... (Not listed in extenso, unfortunately)	6521
140	✓	$n \mid a^{n-1} - a$ Series 1693·5	1, 6, 10, 14 (Not listed in extenso, unfortunately)	Omit
137	✓	Super Poulet numbers Series 2365·2	A subset of the Poulet (or Sarrus or pseudoprime) numbers	
102	✓	Number of regions of polygon Series 1379·5	1, 4, 11, 25, 50, 91, 154 ... $\binom{n}{4}+\binom{n-1}{2}$	6522

111 Theorem: Every quasiperfect has more than 5 different prime factors

(because $\frac{2}{1}\cdot\frac{3}{2}\cdot\frac{5}{4}\cdot\frac{7}{6}\cdot\frac{11}{10} = \frac{77}{16} < 5$ whereas the number of factors to be taken must exceed, not merely equal, 5)

To exceed	2	3	4	(5)	6	7	8	–
we need more than	1	2	3	(5)	8	13	21	– distinct factors
(i.e. we need at least	2	3	4	6	9	14	22 distinct factors)	

(one factor equals but does not exceed 2)
(two factors equal but do not exceed 3)
This appears to be the closest series to the Fibonacci.
Please accept my apologies for not stating this clearly; it is simply explained by HONSBERGER page 111. I have circled this example above, to fix ideas.
The analogous series of products $\frac{3}{2}\cdot\frac{4}{3}\cdot\frac{6}{5}\cdot\frac{8}{7}\cdot\frac{12}{11}$ .... also deserves attention.

Supplement IA.

~~Last two items should be renumbered as 2365·5 and 2368·5~~

✓ Items 921·5 and 922 might be distinguished. Except for 4, seq 922 is square-free (e.g. it does not contain 75)

		2	3	4	5	
Sq 1427 ✓	Even permutations of order 2 ✓	1	3	4	16	This is OK.
1003 ✓	[Odd]	1	1	6	10	Insert word 'odd'
469 ✓	Their sum	2	4	10	16	Permutations of order 2
137 ✓	Their absolute difference	0	2	2	6	

574·5 ✓ (1), 2, 5, 14, 38, 107, Number of domino n-tuples RMM 7. 324. 1974

1930·5 The series $1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+\dots > 1, 2, 3, 4, 5$ of n: > 1, 8, 57, 419, ...

No

from Victor Meally

Scan AG516 – AG522

Victor Neally letter

one page