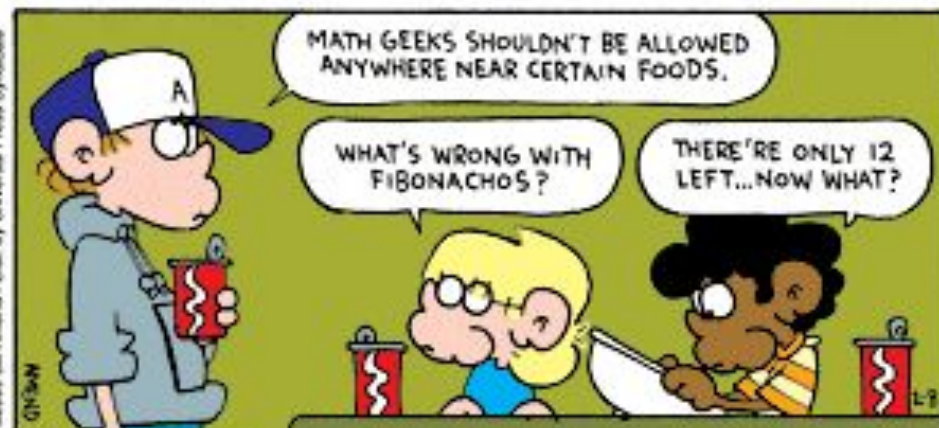




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McGraw-Hill

L-7

Magic

- ▶ Write out the positive integers
- ▶ cross out the even numbers
- ▶ sum the remaining terms

1 ~~2~~ 3 ~~4~~ 5 ~~6~~ 7 ~~8~~ 9 ~~10~~ 11 ~~12~~

1 4 9 16 25 36



or fluke?

Magic

- ▶ Write out the positive integers
- ▶ cross out the multiples of 3
- ▶ sum the remaining terms

1 2 ~~3~~ 4 5 ~~6~~ 7 8 ~~9~~ 10 11 ~~12~~ 13 14 ~~15~~

1 3 7 12 19 27 37 48 61 75

Magic

- ▶ cross out every second number from these sums
- ▶ sum the remaining terms

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	3	7	12	19	27	37	48	61	75					
1		8		27		64		125						

or fluke?



Moessner's magic

- ▶ No prizes for guessing what happens if you start with every fourth number

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	3	6		11	17	24		33	43	54		67	81	96	
1	4			15	32			65	108			175	256		
1				16				81				256			

Moessner's theorem

- ▶ Alfred Moessner: known for his contributions to recreational maths; he wrote for *Scripta Mathematica*, a quarterly journal published by Yeshiva University in New York
- ▶ He published this conjecture in 1951 but never proved it
- ▶ It was proved by Oskar Perron – less than a year after its initial publication.
- ▶ There are several proofs and extensions of Moessner's theorem

Moessner's magic

- ▶ What happens if you start by crossing out the triangle numbers?

① 2 ③ 4 5 ⑥ 7 8 9 ⑩ 11 12 13 14 ⑮