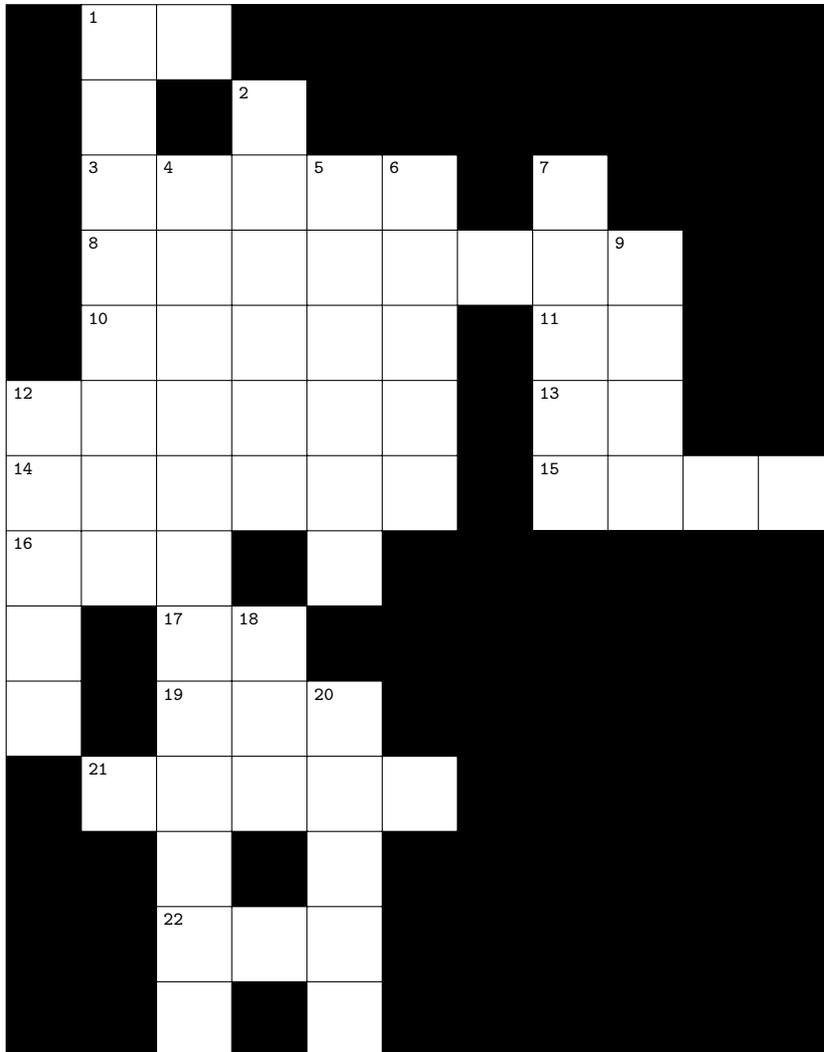


A CROSSNUMBER

META: NOSE FUNCTIONS



In the clues below, n represents the number being clued and k and m represent unspecified positive integers. In neither case is there a connection between these values in different clues.

Across

1. the smallest conductor of an elliptic curve over the rational numbers
3. the sum of the first k Sophie Germain primes
8. (the number of primes between two consecutive powers of 2) + (the floor of $(k/e)^{k/e}$)
10. a divisor of 99999999
11. an even non-totient number
12. (a tribonacci number) + (the number of conjugacy classes in $GL_8(\mathbb{F}_2)$)
13. 2^n contains no zeros
14. (the average of the divisors of n is itself a divisor of n) + (a semiprime tribonacci number)
15. a palindrome with exactly 5 palindromic prime factors (counted with multiplicity)
16. a sum of four consecutive cubes
17. the kissing number in dimension 4
19. the number of permutations of length k with exactly 2 distinct cycle lengths (e.g. any transposition)
21. a palindromic even semiprime not expressible as the sum of two squares
22. a repdigit in base 10 that is also a repdigit when expressed in some smaller base larger than 1.

Down

1. (a Sophie Germain prime equal to the sum of the first k Sophie Germain primes) · (the number of directed graphs with m unlabeled vertices and no self-loops or multiple edges in the same direction)
2. (a double factorial) + ('I'm a teapot')
4. (a prime of the form $p^2 + q + 1$ for consecutive primes p, q) · (a sum of seven consecutive squares) · (a safe prime)
5. (the smallest $n > 2$ so that all positive integers up to the hitchhiker number are squares modulo n) - (a prime of the form $2^k + k^3$)

6. (a centered dodecahedral number) + (a positive cube)
7. an entry of the sequence defined by $a_k = 3a_{k-1} + 5$ and $a_0 = 1$
9. $n + \phi(n)$ is a power of 10
12. a Kaprekar number
18. $n! + 1$ is prime
20. a prime n containing 22-across, where 2 is a square modulo n