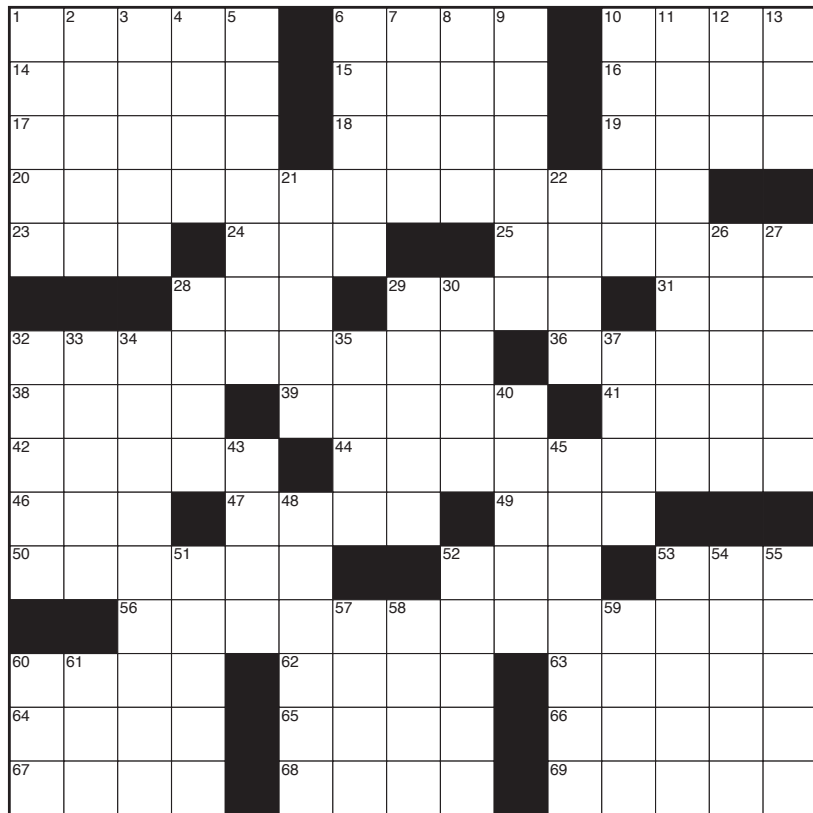




BY THE NUMBERS

DAVID RICHESON

Fill in the entries of this crossword puzzle with a decimal point “.” or a digit 0 through 9. All decimal values that are longer than the given number of blanks are truncated, not rounded.




- 28** Sum of the first four 4th powers
- 29** Young Gauss's sum
- 31** Diagonal of a square with the same area as the unit circle
- 32** Look-and-say sequence
- 36** $1000(30 + \pi^2)$
- 38** 10 times the Basel problem sum
- 39** 2, 3, 5, _____
- 41** Smallest number whose square has eight digits
- 42** Location of the absolute minimum of $g(x) = x^6 - 420x + 100$
- 44** τ
- 46** Emergency number in the US
- 47** $100e^e$
- 49** Bronze ratio,

$$1 + \sqrt{3 + \sqrt{3 + \sqrt{3 + \dots}}}$$
- 50** In Egyptian hieroglyphics:

- 52** Every $3x + 1$ sequence ends this way?

- 53** Fourth Fermat prime
- 56** π
- 60** The 24th Mersenne prime has

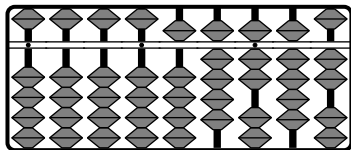
ACROSS

- 1** $5^6 + 189^2$
- 6** Sum and product of its digits are equal
- 10** Number of primes less than 10,000
- 14** Acceleration of gravity in m/s^2
- 15** $\ln(2)/\pi^2$
- 16** Speed of light $\text{_____} \times 10^8 \text{ m/s}$
- 17** $(12 + \sqrt{130})\pi$
- 18** Number of rook moves on a 16×16 board
- 19** Hardy's cab number
- 20** 0, 1, 4, . . .
- 23** Water freezing temperature in Kelvin
- 24** A palindromic permutable prime
- 25** $2 + \frac{1}{1 + \frac{1}{56 + \frac{1}{7}}}$

- this many digits
- 62** 10th Pell number
- 63** π^e
- 64** 30° - _____° - _____° right triangle
- 65** Has digit sum 20 and digit product 336
- 66** a, b, c where $\frac{1449}{50} = a + \frac{1}{b + \frac{1}{c}}$
- 67** In Mayan numerals:

- 68** Fourth perfect number
- 69** Hypotenuse of a Pythagorean triple with sides 27, 560 and 64, 791

DOWN

1



- 2** A fixed point of $f(x) = 2x^{10} - 23x$
- 3** $3825/99 = \underline{\hspace{1cm}}$
- 4** $\lceil \sinh(9) \rceil$
- 5** $11 \cdot 10^3(600 + \sqrt[3]{e})$
- 6** The Sophie Germain prime that generates the safe prime 81,527
- 7** An eigenvalue for $\begin{pmatrix} 2 & 1 \\ 3 & -2 \end{pmatrix}$
- 8** It is 1/9th its reverse
- 9** 45th term in Padovan sequence, which starts 1, 1, 1 and $p_n = p_{n-2} + p_{n-3}$
- 10** $\overline{\text{XMMCLXXXIX}}$
- 11** e
- 12** Number of ways to make change for a dollar without the \$1 coin
- 13** Emergency number in the UK
- 21** In Morse code:
. . . . - - - -
- 22** Circumference of a circle of radius 9/14
- 26** Gelfond–Schneider constant, $2^{\sqrt{2}}$
- 27** Zip code for Elkton, Minnesota (population 141)
- 28** It is CAB in hexadecimal
- 29** Slope of the tangent line to $y = \frac{1}{10}x^{10} - \ln x$ at

$x = 2$

- 30** Fibonacci sequence starting with no rabbits
- 32** 1366th prime number
- 33** Diagonal of a regular pentagon with side-length 10
- 34** $1 + 1/\pi$
- 35** A prime factor of 111,111,111,111,111,111,111,111,111,111
- 37** Append any of its digits to the end and it is prime
- 40** In Chinese counting rods:



- 43** Fifth Mersenne prime
- 45** $\int_0^{10} \frac{1}{2\sqrt{x}} dx$
- 48** Number of sequences of 20 coin tosses starting with heads
- 51** i^i
- 52** In Babylonian cuneiform:
<| | | <| | | <<| | |
- 53** e^π
- 54** Number of 5-letter codes made from A through K with no repetition
- 55** It is 10011001100000111 in binary
- 57** Fourth row of Pascal's triangle
- 58** Euler–Mascheroni constant $\gamma = 0.\underline{\hspace{1cm}}$
- 59** Feet in a mile
- 60** Devil's number
- 61** James Bond's number