Prize Crossnumber

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#2

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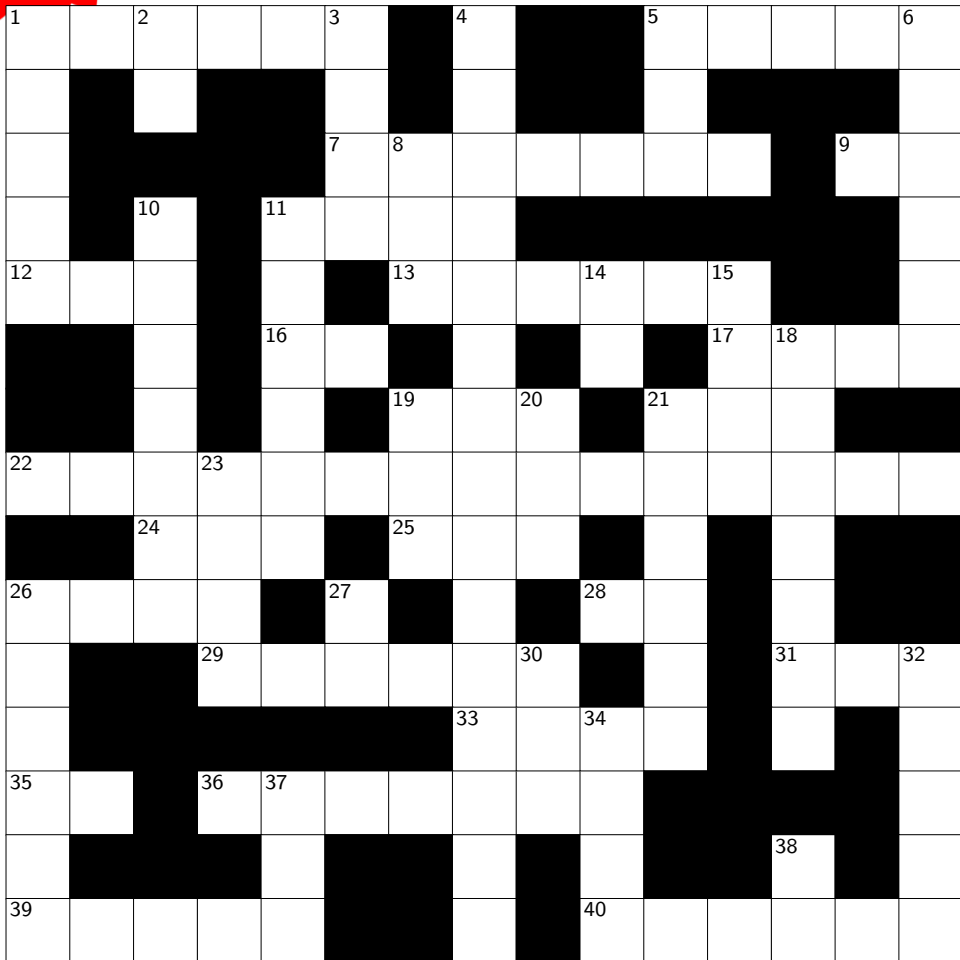**Set by Humbug**

Rules

Although many of the clues have multiple answers, there is only one solution to the completed crossnumber. As usual, no numbers begin with 0. Use of Python, OEIS, Wikipedia, etc. is advised for some of the clues.

To enter, send us the **sum of the across clues** via the form on our website (**chalkdustmagazine.com**) by **5th December 2015**. Only one entry per person will be accepted. Winners will be notified by email and announced on our blog by 19th December 2015. One randomly selected correct answer will win **£100**, and three randomly selected runners up will win a Chalkdust T-shirt. The prizes have been provided by G-Research, researchers of financial markets and investment ideas. Find out more at **gresearch.co.uk**.

Across

1 A multiple of 24A. **(6)**

5 It is possible to construct a regular polygon with this number of sides using only a ruler and compass. **(5)**

7 The number of factors of this number is equal to its fourth root. **(7)**

9 A number with 9 proper factors. **(2)**

11 The first four digits of 4D. **(4)**

12 A prime number. **(3)**

13 30D multiplied by 12A. **(6)**

16 The least number of pence which cannot be made using less than 5 coins. **(2)**

17 Two less than a triangular number. **(4)**

19 The number of consecutive non-prime numbers starting at (and including) 370262. **(3)**

21 A prime number. **(3)**

22 The smallest number with a (multiplicative) persistence of 11. **(15)**

24 The lowest number k such that when 3^k is divided by k the remainder is 24. **(3)**

25 When written as a Roman numeral, this number is an anagram of LCD. **(3)**

26 A year which began or will begin on a Wednesday. **(4)**

28 A multiple of 9. **(2)**

29 All the digits of this number are the same. **(6)**

31 A square number. **(3)**

33 The last four digits of 4D. **(4)**

35 The minimum number of knights needed so that each square on a chessboard is either occupied or attacked by a knight. **(2)**

36 The number of primes less than 100,000,000. **(7)**

39 This number is both square and tetrahedral. **(5)**

40 The smallest even number, n, such that $2^n - 2$ is properly divisible by n. **(6)**

Down

1 The sum of the proper factors of 32D. **(5)**

2 The sum of this number's digits is 8. **(2)**

3 The sum of 34D and 12A. **(4)**

4 The 2nd, 4th, 6th, 8th, 10th, 12th and 14th digits of this number are each larger than the digits either side of them. **(15)**

[**Correction:** The 13th digit is actually larger than the 14th.]

5 The sum of this number's digits is 2D. **(3)**

6 The sum of 32D, 35A and 1A. **(6)**

8 A prime number. **(3)**

10 The number of sequences of 16 (strictly) positive numbers such that each number is one more, one less or the same as the previous number and the first and last numbers are either 1 or 2. **(7)**

11 A palindrome. **(6)**

14 Doubling this number then reversing the digits gives the same results as adding two to this number. **(2)**

15 28A multiplied by the reverse of 5D. **(4)**

18 A power of 3. **(7)**

19 An abundant number. **(3)**

20 The number of degrees Fahrenheit between the boiling and freezing points of water. **(3)**

21 All but one of the digits of this number are the same. **(6)**

23 15D plus 17A subtract 34D. **(4)**

26 The sum of the digits of this number is 3. **(6)**

27 A factor of 25A. **(2)**

30 Not a palindrome. **(3)**

32 The sum of the proper divisors of 1D. **(5)**

34 A square number. **(4)**

37 27D multiplied by 38D. **(3)**

38 A multiple of 10. **(2)**