



Diversions

Friday, 20 Aug 2010

Letter Cubes

A set of four cubes has a distinct letter of the English alphabet on each face. The four cubes can be arranged to form the following words.

BOWL
JUNK
BUOY
MATH
CLUE
SLEW
FLAW
TUSK
FROM
VEAL
GAIN
WIDE
JUMP
ZERO



If the four cubes contain 24 different letters, which letters appear on each of the four cubes?

Word Problem

Jane and John share a flock with N sheep. They sell the sheep for $\$N$ each. They are paid in $\$10$ and $\$1$ bills. There are fewer than 10 $\$1$ bills. When they divide the money, Jane takes a $\$10$ bill and then John takes a $\$10$ bill, then Jane and then John, and so on. Jane takes the first and last $\$10$ bill. Jane offers the remaining $\$1$ bills to John. If they are supposed to divide the money equally, how much more money should Jane give to John?

Quizmaster: Alex Clark.

Quizmaster Assistants: Reena Bhagani, Andrea Blezy, Rachael Verbruggen



Solutions

to Diversions of Thursday, 19 Aug 2010

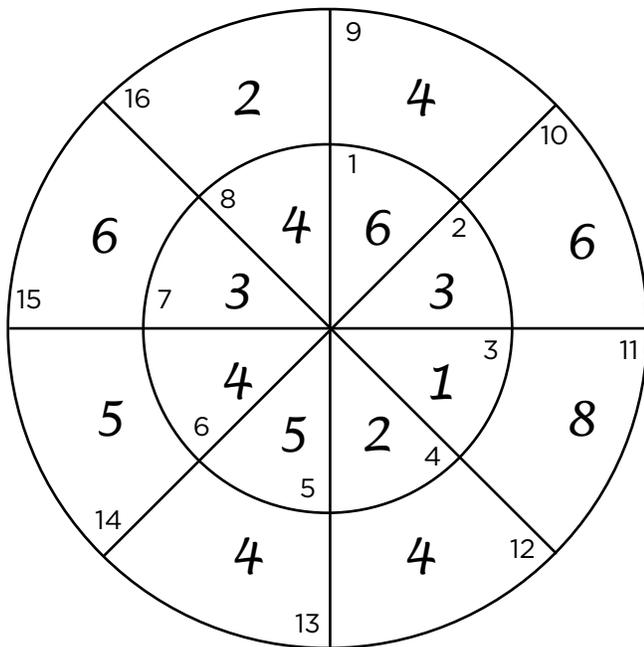
Out and Around

Fill each numbered section with a digit using the clues given. The puzzle has two types of clues.

An outward clue is a clue for a 2-digit number where the first digit is written in the inner circle and the second digit is written in the outer circle of that clue. For example, if the answer to the outward clue 1-8 was 42, then 4 would be written in the blank marked '1' and 2 in the blank marked '8'.

A clockwise clue is a clue for a 3-digit number that is written in a clockwise direction. If the answer to the clockwise clue 12-14 was 619, then 6 would be written in the blank marked '12', 1 in the blank marked '13' and 9 in the blank marked '14'. Note that the clockwise answers overlap each other, which can help when solving the puzzle.

In addition, there are no zeros in the puzzle and there is no limit on the number of times a digit appears.



Outward

- 1-9: a perfect cube
- 2-10: a perfect square
- 3-11: the product of the digits 2-20
- 4-12: can be deduced from other clues
- 5-13: Three times 3-11
- 6-14: can be deduced from other clues
- 7-15: can be deduced from other clues
- 8-16: Same digit repeated

Clockwise

- 1-3: can be deduced from other clues
- 3-5: a perfect cube
- 5-7: consecutive digits
- 7-1: the third digit is the product of the other two
- 9-11: consecutive even digits
- 11-13: the first digit is the sum of the other two
- 13-15: consecutive digits
- 15-9: consecutive even digits

Word Problem

The positive integer N has the following properties.

- When N is divided by 2 the remainder is 1.
- When N is divided by 3 the remainder is 1.
- When N is divided by 4 the remainder is 1.

This pattern continues until N is divided by 11. When N is divided by 11, the remainder is 0. What is the smallest possible value for N ?

Solution: $N - 1$ will have factors of 2, 3, 4, 5, 6, 7, 8, 9 and 10. The least common multiple of all of these numbers is 2520. So, $N = 2520M + 1$. Since N is also divisible by 11, we must have $N = 25201$.