

CHALLENGE '08 - Solutions

DIVISIBILITY PROBLEM

The number 7 does not divide exactly into 99, nor into 999. What is the smallest number made up only of 9's which is divisible by 7, and what is the answer when that number is divided by 7?

999,999 and **142,857**

2. THE LENGTH & BREADTH OF IT

A rectangular room, longer than it is broad, is such that the area of the floor is a whole number of square metres, while the perimeter of the floor is a whole number of metres. Moreover these two numbers are the same. What are the length and breadth of the room?

Length 6m and **breadth 3m**. (if each is a whole number of metres).



3. SCHOOL TRIP

A firm has a large number of coaches of two types, 36-seaters and 12-seaters, but only ten drivers are available. A school wishes to take a total of 240 pupils and teachers to Chester Zoo. What is the smallest number of coaches needed, if there are to be no spare seats, and how many of these are 36-seaters?

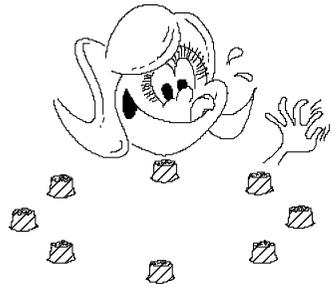
6 x 36 + 2 x 12, 8 coaches altogether

4. TRIFID

The ancient game of Trifid was played with cards of three suits. The cards of one suit were identical and coloured red, the cards of the second were identical and coloured blue, while the cards of the third were identical and coloured green. A hand consisted of four cards from the shuffled pack. How many different hands are possible, and how many of these contain cards of exactly two of the colours?

15 and **9**





5. AFTER EIGHTS?

Eight chocolates are evenly spaced round a circle, at the eight points of the compass, North, North-East, East, and so on right round clockwise to North-West. I eat one chocolate, then count five chocolates from there, clockwise round the circle, eat that chocolate, then again count five chocolates round, eat that chocolate, and so on. Which chocolate must I eat first in order to finish with my favourite (a banana cream fudge) which is at the North point, and on which point is the chocolate, that I eat next to last?

E and SE

6. COIN PILING

Forty-eight identical coins are arranged in six piles all of different heights. What is the smallest number of coins that there can be in the largest pile, and what is the largest number of coins that there can be in the smallest pile?



11 and 5

7. GENEROSITY

Three generous people, Albert, Bill and Charlie, sit round a table. Albert gives Bill as many pounds as Bill has, then Bill gives Charlie as many pounds as Charlie has, then

Charlie gives Albert as many pounds as Albert now has. After all that they have £8 each. How many pounds did each start with?

A had £11, B had £7 and C had £6, £24 altogether.