Maths Challenge – Week 16

Welcome to week 16 of our weekly maths challenge, with problems and puzzles posed by Gordon Burgin, Andrew Holt and the U3A Maths and Stats Subject Adviser - David Martin.

If you would like to share your ideas on how to solve these puzzles please join our learning forum or discuss within your U3A and interest group. **Check back each week for the solutions** and let us know how you get on by contacting National Office. New maths puzzles will go up onto the website every Thursday.

Week Sixteen

Question 1.

Giles estimated that the cost in pounds *C*, of producing *n* wooden toys is C = 7n + 350. Giles sells each toy for £12 and makes a profit when the total income from selling a quantity of toys is greater than the total cost of producing that quantity of toys. How many toys are required to be sold before Giles makes a profit on producing these toys?

Question 2.

The rate of petrol consumption for Aba's van is 25 miles per gallon (mpg) when the van travels at an average speed of 50 miles per hour (mph). The van's petrol tank has 17 gallons of petrol at the beginning of a trip. Aba's van travels two hours at a speed of 50 mph and an additional two hours at 70 mph. If the petrol tank has 6 gallons at the end of the trip, what was the rate of petrol consumption for the second two hours?

Question 3.

If p and q are distinct prime numbers less than 7, what is the maximum value of the highest common factor of $2p^2q$ and $3pq^2$?

Question 4.

In the 4x4 array below how many triples of points are there where all three points lie on a line (not necessarily equally spaced)?