Maths Challenge - Week 299 – Problems

Welcome to week 299 of our weekly maths challenge, with problems and puzzles posed by David Browning, Rod Marshall, Ian Stewart, Annie Stothers 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 the u3a office. New maths puzzles will go up onto the website every Thursday.

Question 1.

Three numbers have a product of 195 and a sum of 29. What are these three numbers?

Question 2.

A man is three times as old as his son. In 12 years, he will be twice as old. How old are they now?

Question 3.

Nine points are selected on a sphere of radius 1. Show that there must be a pair of points not more than $\sqrt{2}$ units apart.

Question 4.

A laboratory type conical flask has a total height of 185 mm including a neck of length 20 mm and a side taper angle of 12º. The internal diameter of the neck is 35 mm. When an initial quantity of 300 ml of liquid is poured into the flask, the height of the liquid is 50 mm. When a further amount of liquid is added, the height increases to 95 mm. What is the total volume of liquid in the flask?