

Maths Challenge - Week 296 – Problems

Welcome to week 296 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.

Jan's purse contains six coins; 1p, 2p, 5p, 10p, 20p and 50p. What coins would she need to add to be able to make up any amount from 1p to 99p?

Question 2.

Solve $\sqrt{x+9} + \sqrt{16-x} = 7$

Question 3.

If you connect the midpoints of adjacent sides of a regular polygon, you get a smaller regular polygon with the same number of sides. What proportion of the area of the larger polygon is the smaller polygon when the number of sides is:

- a) 3?
- b) 4?
- c) 6?

Question 4.

John is going to walk at a constant speed of 1 m/s to a bench which is 600 metres from him. His grandson Peter prefers to run and he decides that, when John starts to walk towards to the bench, he will run to the bench and then run back to John. On his first return trip, Peter runs at a speed of 5 m/s. He then continues running to the bench and then back to John but his speed on the second return trip is 4 m/s, on the third return trip it is 3 m/s, on the fourth return trip it is 2 m/s and he then walks at 1 m/s with John until they both reach the bench. How far will Peter have run or walked when he and John reach the bench?