Puzzle: December 2023

Ramanujan told Hardy that the smallest number expressible as the sum of two cubes in two different ways was:

$$1729 = 9^3 + 10^3 = 12^3 + 1^3.$$

Very good, but I thought it better to try and find the smallest number expressible as the sum of *three* cubes in *three* different ways.

Whilst having breakfast at the STMC final in 2019 I realised:

$$3^3 + 4^3 + 5^3 = 6^3 \text{ (1) and } 1^3 + 6^3 + 8^3 = 9^3 \text{ (2).}$$

Multiplying (1) by 3^3 gives $9^3 + 12^3 + 15^3 = 18^3$.

Multiplying (2) by 2^3 gives $2^3 + 12^3 + 16^3 = 18^3$.

So I had possibly found the smallest number expressible as the sum of three cubes in *two* different ways. I was so excited I told Andrew Jobbings and Alan Slomson. Alan told me he thought that the smallest number expressible as the sum of three cubes in three different ways was 54^3.

Find three cubes in three different ways that sum to 54^3.

The names of those sending answers to volunteering@ukmt.org.uk by 31st January will appear in the next Volunteers Newsletter.

Puzzle: September 2023 Answers:

4	5	2	6	9	1	0	+
2	5	3	7	8	0	5	
7	0	6	4	7	1	5	

4	5	3	6	7	9	0	+
3	5	2	8	1	0	5	
8	0	6	4	8	9	5	

6	5	2	7	8	3	0	+
2	5	4	9	1	0	5	
9	0	7	6	9	3	5	

Answers from;

Tony CSylvia N Charlie O