

June 3rd

Write down any 4-digit number and add it to the number with the same digits in reversed order.

Can you explain why their sum is always divisible by 11?

For example:

$$3582 + 2853 = 6435 \quad (= 11 \times 585)$$

In general

$$\text{"abcd"} + \text{"dcba"} =$$

$$1000a + 100b + 10c + d + 1000d + 100c + 10b + a =$$

$$1001a + 110b + 110c + 1001d =$$

$$11(91a + 10b + 10c + 91d)$$

Hence is always divisible by 11