

If we take three numbers a, b , and c , such that $a \neq b \neq c \neq 0$, and construct a 3-digit number like so:

$$a \times 100 + b \times 10 + c$$

$$N = 100a + 10b + c$$

Evidently a is the hundred digit, b is the ten digit and c is the unit digit.

To reverse the digits, so that c is the hundred digit, b is the ten digit and a is the unit digit:

$$R = 100c + 10b + a$$

Then we subtract N and R :

$$\begin{cases} N - R, & N > R \\ R - N, & N < R \end{cases}$$

Now $N - R = 100a + 10b + c - (100c + 10b + a) = 99a - 99c$ and

$$R - N = 100c + 10b + a - (100a + 10b + c) = -99a + 99c$$

Let us examine the case of $N > R$ first:

$$N - R = 99a - 99c = 99(a - c)$$

This forms a 3-digit number that must be a multiple of 99.