$Let\ a \in \mathbb{N}_0, b \in \mathbb{N}_0, where:$

1. $a\ mod(10) + b\ mod(10) > 0$
2. $\lfloor \log_{10}(a) \rfloor = \lfloor \log_{10}(b) \rfloor$
3. $\lfloor \log_{10}(a) \rfloor + \lfloor \log_{10}(b) \rfloor + 1 = \lfloor \log_{10}(a \cdot b) \rfloor$
4. $(a+b)\ mod\ 9 = (a \cdot b)\ mod\ 9$
5. $g(x) = \begin{Bmatrix} 0, \ if\ x \neq 0 \\ 1, \ if\ x = 0 \end{Bmatrix}, x \in \mathbb{N}_0,$

$$\forall\ j \in [2,9], \sum_{i=1}^{\lfloor \log_{10}(a) \rfloor + 1} g\left(\frac{a\ mod(10^i)}{10^{i-1}} - j\right) + \sum_{i=1}^{\lfloor \log_{10}(b) \rfloor + 1} g\left(\frac{b\ mod(10^i)}{10^{i-1}} - j\right) = \sum_{i=1}^{\lfloor \log_{10}(a \cdot b) \rfloor + 1} g\left(\frac{(a \cdot b)\ mod(10^i)}{10^{i-1}} - j\right)$$

$Then:$

$$\forall\ j \in [0,9], \sum_{i=1}^{\lfloor \log_{10}(a) \rfloor + 1} g\left(\frac{a\ mod(10^i)}{10^{i-1}} - j\right) + \sum_{i=1}^{\lfloor \log_{10}(b) \rfloor + 1} g\left(\frac{b\ mod(10^i)}{10^{i-1}} - j\right) = \sum_{i=1}^{\lfloor \log_{10}(a \cdot b) \rfloor + 1} g\left(\frac{(a \cdot b)\ mod(10^i)}{10^{i-1}} - j\right)$$