**Number Pattern**

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**The number pattern can continue, can you prove this using algebra?**

The proof is as follows:

 $\left(\frac{10^{n}-4}{6}\right)^{3}$**+**$\left(\frac{10^{n}}{2}\right)^{3}$**+**$\left(\frac{10^{n}-1}{3}\right)^{3}$

 $=\frac{1}{6^{3}}\left[\left(10^{n}-4\right)^{3}+27\left(10^{n}\right)^{3}+8\left(10^{n}-1\right)^{3}\right]$

 $=\frac{1}{6^{3}}\left[\begin{array}{c}\left(10^{3n}-12×10^{2n}+48×10^{n}-64\right)+27×10^{3n}\\+\left(8×10^{3n}-24×10^{2n}+24×10^{n}-8\right)\end{array}\right]$

 $=\frac{1}{6^{3}}\left[36×10^{3n}-36×10^{2n}+72×10^{n}-72\right]$

 $=\frac{1}{6}\left[10^{3n}-10^{2n}+2×10^{n}-2\right]$

 $=$ $\frac{1}{6}\left(10^{3n}-4×10^{2n}\right)$$+5×10^{2n-1}$ **+** $\frac{10^{n}-1}{3}$

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