$$\sum_{k=1}^{n} k5^k = \frac{5}{16}\left(n5^{n+1} - (n+1)5^n + 1\right) =$$

$$= \frac{n5^{n+2}}{16} - \frac{(n+1)5^{n+1}}{16} + \frac{5}{16} \quad (*)$$

$$\sum_{k=1}^{n+1} k5^k = \sum_{k=1}^{n} k5^k + (n+1)5^{n+1} =$$

$$= \frac{n5^{n+2}}{16} - \frac{(n+1)5^{n+1}}{16} + \frac{5}{16} + (n+1)5^{n+1} =$$

$$= \frac{n5^{n+2} - (n+1)5^{n+1} + 16(n+1)5^{n+1} + 5}{16}$$

???

~~$(n+1)5^{n+2} - (n+2)5^{n+1}$~~

$$\frac{(n+1)5^{n+3} - (n+2)5^{n+2} + 5}{16}$$