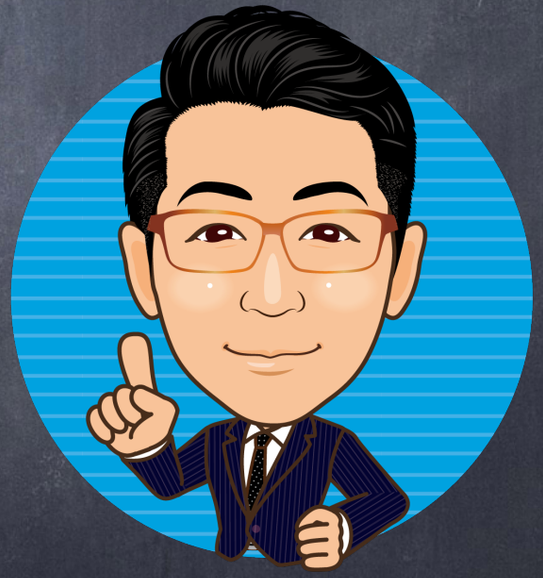
シグマ記号応用①

教科書 p.89,90

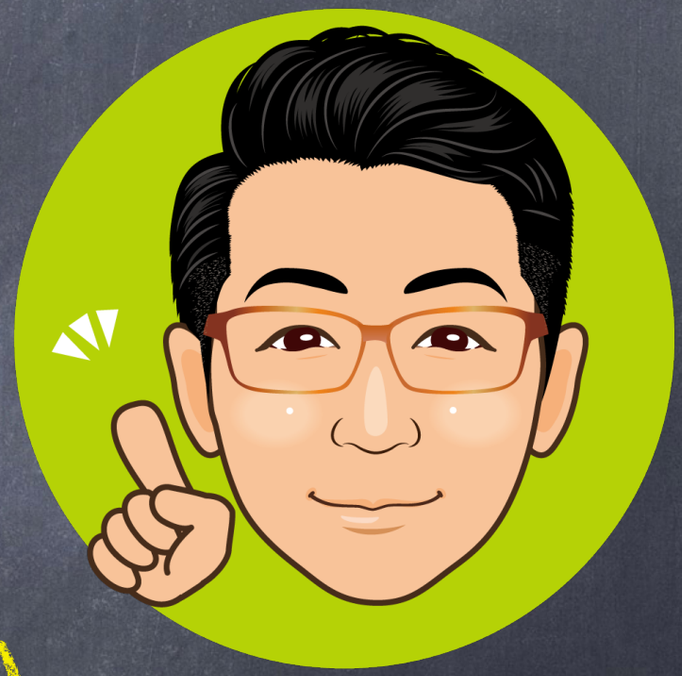


〈和の公式〉

① $\sum_{k=1}^{n} C = C + C + \cdots + C = nC$

cはkと無関係な数

(特に. $\sum_{k=1}^{n} 1 = 1 + \cdots + 1 = n$)



② $\sum_{k=1}^{n} k = 1 + 2 + \cdots + n$

初項1, 公差1, 項数n

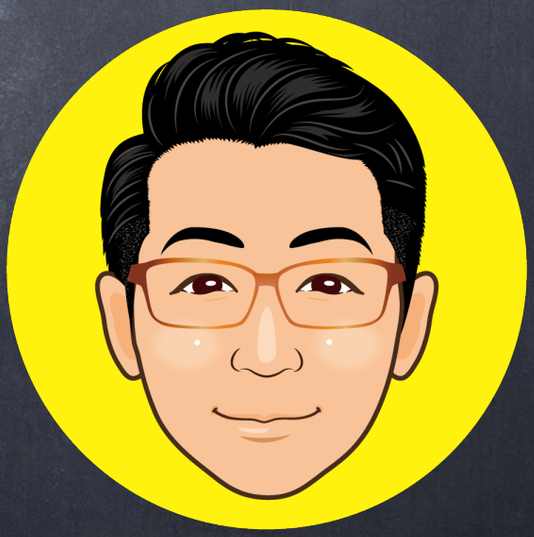
$= \frac{1}{2} n(n+1)$

〈和の公式〉

③ $\sum_{k=1}^{n} k^2 = \underbrace{1^2+2^2+\cdots+n^2}_{\text{等差でも等比でもない!!}} = ?$

⇒ 導出が大変!!

④ $\sum_{k=1}^{n} k^3 = \underbrace{1^3+2^3+\cdots+n^3}_{\text{等差でも等比でもない!!}} = ?$

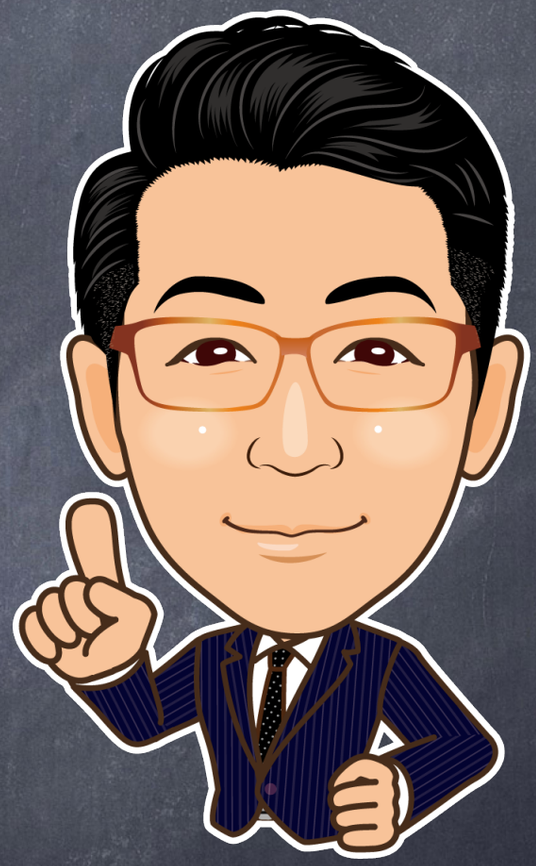


〈まとめ〉

① $\sum_{k=1}^{n} C = nC$　② $\sum_{k=1}^{n} k = \frac{1}{2}n(n+1)$

③ $\sum_{k=1}^{n} k^2 = \frac{1}{6}n(n+1)(2n+1)$

④ $\sum_{k=1}^{n} k^3 = \left\{\frac{1}{2}n(n+1)\right\}^2$



(ex) $\sum_{k=1}^{12} k^2 = 1^2 + \cdots + 12^2 = \frac{1}{6} \times 12 \times (12+1)(24+1)$

$= \underline{650}$