



Air maths tuition

Interact, engage and perform

Sigma Notation

| Past Paper Question | C1 Edexcel June 2011 Q5c

$$a_1 = k$$


$$a_{n+1} = 5a_n + 3 \quad n \geq 1 \quad \text{where } k \text{ is a positive integer}$$

$$a_1 = k, \quad a_2 = 5k + 3, \quad a_3 = 25k + 18$$

i) Find $\sum_{r=1}^4 a_r$ ii) Show that $\sum_{r=1}^4 a_r$ is divisible by 6

$$\begin{aligned} \text{i) } \sum_{r=1}^4 a_r &= a_1 + a_2 + a_3 + a_4 \\ &= k + 5k + 3 + 25k + 18 + 5(25k + 18) + 3 \\ &= 31k + 21 + 125k + 90 + 3 \\ &= 156k + 114 \end{aligned}$$

$$\begin{aligned} \text{ii) } \sum_{r=1}^4 a_r &= 156k + 114 \\ &= 6(26k + 19) \\ &= 6(\text{integer}) \end{aligned}$$

\therefore divisible by 6
since 6 is a factor. 

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