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Sequences
| Past Paper Question | C1 Edexcel Jan 2013 Q4

A sequence $u_1, u_2, u_3, \ldots$ satisfies $u_{n+1} = 2u_n - 1, \ n \geqslant 1$

Given that $u_2 = 9$,

(a) find the value of u_3 and the value of u_4. (b) evaluate $\sum_{r=1}^{4} u_r$

a) when $n = 2$

$u_3 = 2u_2 - 1$

$= 2(9) - 1$

$= 17$

when $n = 3$

$u_4 = 2u_3 - 1$

$= 2(17) - 1$

$= 33$

b) $\sum_{r=1}^{4} u_r = u_1 + u_2 + u_3 + u_4$

$= 5 + 9 + 17 + 33$

$= 64$

$9 = 2u_1 - 1$

$\therefore 10 = 2u_1$

$\therefore u_1 = 5$

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