Recurrence relationships race

① $a_1 = 5$

$a_{n+1} = a_n + 3$

$a_2 = 5+3 = 8$

$a_3 = 8+3 = 11$

$a_4 = 11+3 = \underline{14}$

② $a_1 = 2$

$a_{n+1} = 5 - 2a_n$

$a_2 = 5 - 2\times2 = 1$

$a_3 = 5 - 2\times1 = 3$

$a_4 = 5 - 2\times3 = \underline{-1}$

③ $a_1 = 3$

$a_{n+1} = 2a_n + 4$

$a_2 = 2\times3 + 4 = 10$

$a_3 = 2\times10 + 4 = 24$

$a_4 = 2\times24 + 4 = 52$

$\sum_{k=1}^{k=4} a_k = 52 + 24 + 10 + 3$

$= \underline{89}$

④ $a_1 = 7$

$a_2 = -2$

$a_{n+1} = a_n + 2k$

$a_2 = 7 + 2k$

$-2 = 7 + 2k$

$-9 = 2k$

$k = -\frac{9}{2}$

⑤ $a_1 = k$

$a_{n+1} = 2a_n - 1$

$a_2 = 2k - 1$

$a_3 = 2(2k-1) - 1$

$= 4k - 2 - 1$

$= 4k - 3$

$\sum_{n=1}^{n=3} a_n \quad k + 2k - 1 + 4k - 3$

$= 7k - 4$

⑥ $a_1 = -2$

$a_2 = 8$

$a_{n+2} = -1 + a_{n-1} + a_n$

$a_3 = -1 + 8 - 2 = 5$

$a_4 = -1 + 5 + 8 = \underline{12}$

(7) $a_1 = 6$

$a_2 = 8$

$a_3 = 1$

$a_{n+2} = 2k + a_n - a_{n+1}$

$a_3 = 2k + a_1 - a_2$

$1 = 2k + 6 - 8$

$1 = 2k - 2$

$3 = 2k$

$k = \frac{3}{2}$

(8) $a_1 = 20$

$a_2 = 18$

$a_3 = 17$

$a_{n+1} = ka_n + b$

$a_2 = ka_1 + b$

$a_3 = ka_2 + b$

$18 = 20k + b$

$-\ 17 = 18k + b$

$1 = 2k$

$k = \frac{1}{2}$

$18 = 20 \times \frac{1}{2} + b$

$18 = 10 + b$

$8 = b$