



永春高中數學科 階城盃答案卷



班級 315 座號 6 姓名 [REDACTED] 第 70 期第 — 大題

最佳解!

(1) $P_{114} = (x_{114}, y_{114})$

$x_1 = 0$
 $x_2 = x_1 - (-1)^1 \cdot 2$
 $x_3 = x_2 - (-1)^2$
 $x_4 = x_3 - (-1)^3 \cdot 4$
 $x_5 = x_4 - (-1)^4$
 $x_6 = x_5 - (-1)^5 \cdot 6$
 $\vdots$
 $x_{113} = x_{112} - (-1)^{59}$
 $+1 x_{114} = x_{113} - (-1)^{59} \cdot 114$
 $x_{114} = (2 - 4 + 6 - 8 + \dots + 114)$
 $= (2 + 6 + \dots + 114) - (4 + 8 + \dots + 112)$
 $= \frac{116 \cdot 29}{2} - \frac{116 \cdot 28}{2} = \frac{116}{2} = 58$

$y_1 = 0$
 $y_2 = y_1 - (-1)^1$
 $y_3 = y_2 - (-1)^1 \cdot 3$
 $\vdots$
 $y_{112} = y_{111} - (-1)^{56} \cdot 56$
 $y_{113} = y_{112} - (-1)^{56} \cdot 113$
 $+1 y_{114} = y_{113} - (-1)^{59}$
 $y_{114} = (3 - 5 + \dots - 113) + 1$
 $= (3 + 7 + \dots + 111) - (5 + 9 + \dots + 113) + 1$
 $= \frac{114 \cdot 28}{2} - \frac{118 \cdot 28}{2} + 1 = 14 \cdot (-4) + 1 = -55$
 $\therefore P_{114}(58, -55)$

(2) $x_1 = 0$
 $x_2 = x_1 - (-1)^1 \cdot 2$
 $x_3 = x_2 - (-1)^2$
 $x_4 = x_3 - (-1)^3 \cdot 4$
 $\vdots$
 $x_{2023} = x_{2022} - (-1)^{1012}$
 $x_{2024} = x_{2023} - (-1)^{1012} \cdot 2024$
 $+1 x_{2025} = x_{2024} - (-1)^{1013}$
 $x_{2025} = (2 - 4 + 6 - \dots - 2024) < 0$

$y_1 = 0$
 $y_2 = y_1 - (-1)^1$
 $y_3 = y_2 - (-1)^1 \cdot 3$
 $\vdots$
 $y_{2024} = y_{2023} - (-1)^{1012}$
 $+1 y_{2025} = y_{2024} - (-1)^{1012} \cdot 2025$
 $y_{2025} = (3 - 5 + \dots - 2025) < 0$
故 P_{2025} 為第三象限

(3) $P_{114}(58, -55)$

$\Rightarrow P_{115}(58 - (-1)^{59}, -55 - (-1)^{59} \cdot 115)$
 $= (57, 60)$
 $\Rightarrow P_{116}(57 - (-1)^{58} \cdot 116, 60 - (-1)^{58})$
 $= (-59, 59)$
 $\Rightarrow P_{117}(-59 - (-1)^{59}, 59 - (-1)^{59} \cdot 117)$
 $= (-58, -58)$
 $\Rightarrow P_{118}(-58 - (-1)^{59} \cdot 118, -58 - (-1)^{59})$
 $= (60, -59)$

$m_{P_{114}, P_{118}} = \frac{-2}{2} = -1$
 $\Rightarrow \overleftrightarrow{P_{114} P_{118}}: x + y = 3$

$\Rightarrow P_{2028}(1013 - 2028, 1016 - 1)$
 $= (-1015, 1015)$
 $\Rightarrow P_{2029}(-1015 + 1, 1015 - 2029)$
 $= (-1014, -1014)$
 $m_{P_{2025}, P_{2029}} = \frac{2}{2} = 1$
 $\Rightarrow \overleftrightarrow{P_{2025} P_{2029}}: x - y = 0$

$\begin{cases} x + y = 3 \\ x - y = 0 \end{cases} \Rightarrow \begin{cases} x = 3/2 \\ y = 3/2 \end{cases}$
 $\therefore (3, 3/2)$

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