

1964 年東大理 4 文 4 共通

$P_1(x_1, y_1), P_2(x_2, y_2), P_3(x_3, y_3), P_4(x_4, y_4)$ とする。条件より

$$\begin{cases} x_1 = \frac{x_4 + 0}{2} \\ y_1 = \frac{y_4 + 2}{2} \end{cases} \begin{cases} x_2 = \frac{x_1 + 0}{2} \\ y_2 = \frac{y_1 + 0}{2} \end{cases} \begin{cases} x_3 = \frac{x_2 + 1}{2} \\ y_3 = \frac{y_2 + 0}{2} \end{cases} \begin{cases} x_4 = \frac{x_3 + 2}{2} \\ y_4 = \frac{y_3 + 2}{2} \end{cases}$$

$$x_1 = \frac{x_4}{2} \text{ より } x_2 = \frac{x_1}{2} = \frac{x_4}{4} \quad x_3 = \frac{x_2 + 1}{2} = \frac{x_4}{8} + \frac{1}{2} \quad x_4 = \frac{x_3}{2} + 1 = \frac{x_4}{16} + \frac{5}{4} \quad 16x_4 = x_4 + 20 \quad 15x_4 = 20$$

$$\therefore x_4 = \frac{4}{3} \quad \therefore x_1 = \frac{2}{3}, x_2 = \frac{1}{3}, x_3 = \frac{2}{3}$$

$$y_1 = \frac{y_4}{2} + 1 \text{ より } y_2 = \frac{y_1}{2} = \frac{y_4}{4} + \frac{1}{2} \quad y_3 = \frac{y_2}{2} = \frac{y_4}{8} + \frac{1}{4} \quad y_4 = \frac{y_3}{2} + 1 = \frac{y_4}{16} + \frac{9}{8} \quad 16y_4 = y_4 + 18 \quad 15y_4 = 18$$

$$\therefore y_4 = \frac{6}{5} \quad \therefore y_1 = \frac{8}{5}, y_2 = \frac{4}{5}, y_3 = \frac{2}{5}$$

求める座標は

$$\therefore P_1\left(\frac{2}{3}, \frac{8}{5}\right), P_2\left(\frac{1}{3}, \frac{4}{5}\right), P_3\left(\frac{2}{3}, \frac{2}{5}\right), P_4\left(\frac{4}{3}, \frac{6}{5}\right) \dots\dots (\text{答})$$

P_1 と P_3 の x 座標は等しく、 $P_1P_3 = \frac{6}{5}$ 。

P_2 と P_4 の x 座標の差は 1。

四角形 $P_1P_2P_3P_4$ の面積は $\frac{1}{2} \cdot \frac{6}{5} \cdot 1 = \frac{3}{5} \dots\dots (\text{答})$

