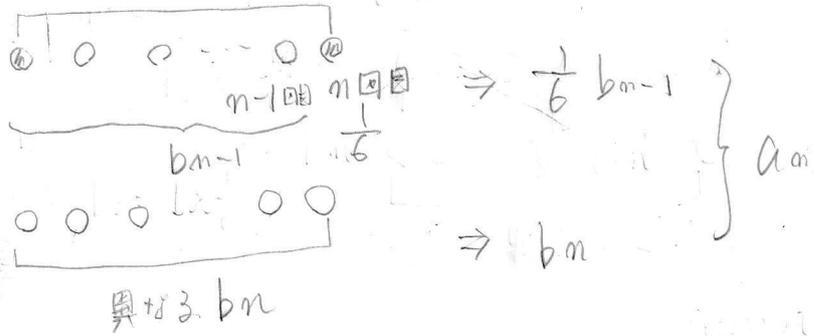


1) 1回2回3回 m 回
 $\bigcirc \bigcirc \bigcirc$ と同じように $\frac{5}{6}$ \dots \bigcirc
 1 と同じように $\frac{5}{6}$

$$1 \times \frac{5}{6} \times \frac{5}{6} \dots \frac{5}{6} = \left(\frac{5}{6}\right)^{m-1} \quad \left(\frac{5}{6}\right)^{m-1}$$

(2) $a_2 = b_2 = \frac{5}{6}$

$n \geq 3$ のとき



$$a_n = b_n + \frac{1}{6} b_{n-1} \quad (n \geq 3)$$

3) (1), (2) より $b_2 = \frac{5}{6}$

$$b_n + \frac{1}{6} b_{n-1} = \left(\frac{5}{6}\right)^{n-1}$$

両辺に $\left(\frac{5}{6}\right)^n$ をかけると

$$\left(\frac{6}{5}\right)^n b_n + \frac{1}{6} \left(\frac{6}{5}\right)^n b_{n-1} = \left(\frac{5}{6}\right)^n \cdot \left(\frac{6}{5}\right)^n \cdot \left(\frac{5}{6}\right)^{n-1}$$

$$\left(\frac{6}{5}\right)^n b_n + \frac{1}{6} \left(\frac{6}{5}\right)^{n-1} b_{n-1} = \frac{6}{5}$$

$$\left(\frac{6}{5}\right)^n b_n = c_n \text{ とおくと } n \geq 2$$

$$c_n + \frac{1}{5} c_{n-1} = \frac{6}{5}$$

$$c_n + d = -\frac{1}{5} (c_{n-1} + d) \text{ とおくと } d = -1 \text{ あり}$$

$$c_n - 1 = -\frac{1}{5} (c_{n-1} - 1)$$

$c_n - 1$ は初項 $c_2 - 1 = \frac{6}{5} - 1 = \frac{1}{5}$ 、公比 $-\frac{1}{5}$ の等比数列

$$c_n - 1 = \frac{1}{5} \left(-\frac{1}{5}\right)^{n-2} \rightarrow c_{n-1} = -\left(-\frac{1}{5}\right) \left(-\frac{1}{5}\right)^{n-2} \rightarrow c_n = 1 - \left(-\frac{1}{5}\right)^{n-1}$$

$$\left(\frac{6}{5}\right)^n b_n = 1 - \left(-\frac{1}{5}\right)^{n-1} \quad | \quad |$$

$$b_n = \left(\frac{5}{6}\right)^n - 5 \left(-\frac{1}{6}\right)^{n-1} \quad (n \geq 2)$$

とあり