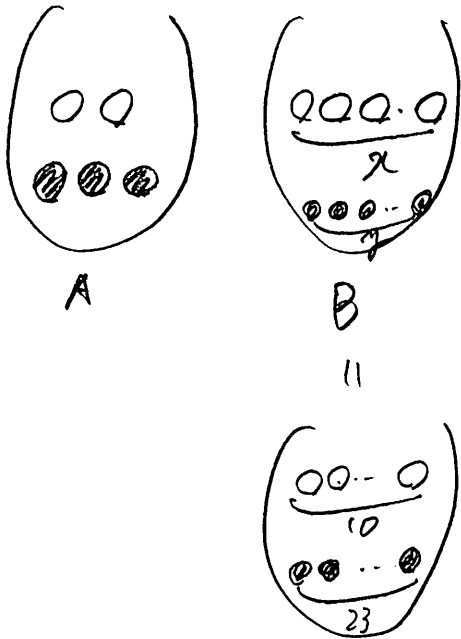


□ x, y : 自然数

(1) $x=10, y=23$



| | | | |
|---|---|---|------------------------------------|
| | A | B | |
| ① | 白 | 白 | $\frac{2}{5} \times \frac{11}{34}$ |
| ② | 黒 | 黒 | $\frac{3}{5} \times \frac{24}{34}$ |

①, ② は互いに排反ゆえ

$$P = \frac{2}{5} \cdot \frac{11}{34} + \frac{3}{5} \cdot \frac{24}{34}$$

$$= \frac{22 + 72}{5 \cdot 34}$$

$$= \frac{94}{170} = \frac{47}{85}$$

(2) $1 \leq x \leq 1000$
 $1 \leq y \leq 1000$

| | | | |
|---|---|---|--|
| | A | B | |
| ① | 白 | 白 | $\frac{2}{5} \times \frac{x+1}{x+y+1}$ |
| ② | 黒 | 黒 | $\frac{3}{5} \times \frac{y+1}{x+y+1}$ |

$$P = \frac{2}{5} \frac{x+1}{x+y+1} + \frac{3}{5} \frac{y+1}{x+y+1}$$

$$= \frac{2x+3y+5}{5(x+y+1)} = \frac{47}{85}$$

$$17(2x+3y+5) = 47(x+y+1)$$

$$13x - 4y - 38 = 0$$

$$13x - 4y = 38$$

$$13 \cdot 1 - 4 \cdot 3 = 1$$

$$13 \cdot 38 - 4 \cdot 114 = 38$$

$$13x - 4y = 38$$

$$\rightarrow 13 \cdot 38 - 4 \cdot 114 = 38$$

$$13(x-38) - 4(y-114) = 0$$

$$13(x-38) = 4(y-114)$$

13と4は互いに素ゆえ

$$x-38 = 4k \quad (k: \text{整数})$$

$$y-114 = 13k$$

$$1 \leq x = 4k + 38 \leq 1000$$

$$1 \leq y = 13k + 114 \leq 1000$$

①) 互いに素ゆえ

$$k = -8, -7, -6, \dots, 68$$

$$68 - (-9) = 77$$