

13 1 (Упорядочение)

$$1a. P = \frac{C_{13}^4}{C_{52}^4} = \frac{13! / (4! \cdot 9!)}{\cancel{52!} / (\cancel{4!} \cdot \cancel{48!})} = \frac{715}{270725} = 0.002641$$

$52 \cdot 51 \cdot 50 \cdot 49$

$$1b. P = P_{1T} + P_{2T} + P_{3T} + P_{4T}$$

$$\begin{aligned} & \square \square \square \square = \frac{1}{52} \cdot \frac{50}{51} \cdot \frac{49}{50} \cdot \frac{48}{49} \\ & + \square \square \square \square = \frac{51}{52} \cdot \frac{1}{51} \cdot \frac{49}{50} \cdot \frac{48}{49} \\ & + \square \square \square \square = \frac{51}{52} \cdot \frac{50}{51} \cdot \frac{1}{50} \cdot \frac{48}{49} \\ & + \square \square \square \square = \frac{51}{52} \cdot \frac{50}{51} \cdot \frac{49}{50} \cdot \frac{1}{49} \end{aligned}$$

Ровно 1 раз

$$= \frac{48}{52 \cdot 51} + \frac{48}{52 \cdot 50} + \frac{48}{52 \cdot 49} + \frac{1}{52} = \frac{1}{52} \left(\frac{48}{51} + \frac{48}{50} + \frac{48}{49} + 1 \right)$$

$$P_{1T} = 0.07463$$

Ровно 2 раза

$$\begin{aligned} & \square \square \square \square = \frac{1}{52} \cdot \frac{1}{51} \cdot \frac{48}{50} \cdot \frac{48}{49} = \frac{48 \cdot 48 + 50 \cdot 48 + 50 \cdot 49 + 51 \cdot 48 + 51 \cdot 49 + 51 \cdot 50}{52 \cdot 51 \cdot 49 \cdot 48} \\ & \square \square \square \square = \frac{1}{52} \cdot \frac{50}{51} \cdot \frac{1}{50} \cdot \frac{48}{49} \\ & \square \square \square \square = \frac{1}{52} \cdot \frac{50}{51} \cdot \frac{48}{50} \cdot \frac{1}{49} \\ & \square \square \square \square = \frac{51}{52} \cdot \frac{1}{51} \cdot \frac{1}{50} \cdot \frac{48}{49} \\ & \square \square \square \square = \frac{51}{52} \cdot \frac{1}{51} \cdot \frac{48}{50} \cdot \frac{1}{49} \\ & \square \square \square \square = \frac{51}{52} \cdot \frac{50}{51} \cdot \frac{1}{50} \cdot \frac{1}{49} \end{aligned}$$

$$P_{2T} = 0.002262$$

Ровно 3

$$\begin{aligned} & \square \square \square \square = \frac{1}{52} \cdot \frac{1}{51} \cdot \frac{1}{50} \cdot \frac{48}{49} \\ & \square \square \square \square = \frac{1}{52} \cdot \frac{1}{51} \cdot \frac{48}{50} \cdot \frac{1}{49} \\ & \square \square \square \square = \frac{1}{52} \cdot \frac{50}{51} \cdot \frac{1}{50} \cdot \frac{1}{49} \\ & \square \square \square \square = \frac{51}{52} \cdot \frac{1}{51} \cdot \frac{1}{50} \cdot \frac{1}{49} \end{aligned}$$

$$P_{3T} = \frac{48 + 49 + 50 + 51}{52 \cdot 51 \cdot 50 \cdot 49} = 0.00003047$$

Ровно 4

$$\square \square \square \square = \frac{1}{52} \cdot \frac{1}{51} \cdot \frac{1}{50} \cdot \frac{1}{49}$$

$$P_{4T} = 0.0000001539$$

$$P = 0.07692 = 1/13!$$