1 Задание $\left(c_n^k = \dfrac{n!}{k!(n-k)!} \right)$

а) $P = \dfrac{C_{13}^4}{C_{52}^4} = \dfrac{\frac{13!}{4!(13-4)!}}{\frac{52!}{4!(52-4)!}} = \dfrac{\frac{13!}{4!\,9!}}{\frac{52!}{4!\,48!}} = \dfrac{13!\,48!}{9!\,52!} = \dfrac{10\cdot11\cdot12\cdot13}{49\cdot50\cdot51\cdot52} = \dfrac{11}{4165} \approx 0{,}0026$

б) $P = 1 - \dfrac{C_{48}^4}{C_{52}^4} = 1 - \dfrac{\frac{48!}{4!(48-4)!}}{\frac{52!}{4!(52-4)!}} = 1 - \dfrac{\frac{48!}{4!\,44!}}{\frac{52!}{4!\,48!}} \approx 0{,}2812$

2 Задание 2

$P = \dfrac{1}{C_{10}^3} = \dfrac{1}{\frac{10!}{3!(10-3)!}} = \dfrac{3!\,7!}{10!} \approx 0{,}0083$

3 Задание

$P = \dfrac{9}{15}\cdot\dfrac{8}{14}\cdot\dfrac{7}{13} = \dfrac{12}{65} \approx 0{,}1846$

4 Задание

$P = \dfrac{1}{C_{100}^2} = \dfrac{1}{\frac{100!}{2!(100-2)!}} = \dfrac{2!\,98!}{100!} \approx 0{,}0002$