Test 3 (11th December 2023)

Task 1: At a Christmas market kiosk, tourists can buy unflavored, vanilla-flavored, or almond-flavored hot chocolate. We observe the following frequencies of hot chocolates purchased by children and adults:

	unflavoured	vanilla-flavoured	almond-flavoured
children	15	30	15
adults	15	10	15

Test on the statistical level

a) $\alpha = 5\%$ whether the numbers of child customers and adult customers are approximately the same, (3 points)

b) $\alpha = 1\%$ whether the type of the chosen flavour depends on the age class (children vs. adults). (3 points)

Task 2: Consider a game with 4 levels. The probability of winning a level is 0.6, and a loss occurs with the remaining probability. When you win the i-th level, you jump to the next level, i.e. to the $(i+1)$-th level (except when you win the 4th level, in which case you stay at the 4th level). When you lose the i-th level, you drop down 1 level, i.e. to the $(i-1)$-th level (except when you lose the first level, in which case you stay at the first level). Find the transition probability matrix and the stationary distribution. (4 points)