

Null: $\frac{1}{37}$ for ~~an~~^{every} outcome to occur

$$\chi^2 = \frac{(238 - 500 \cdot \frac{1}{37})^2}{500 \cdot \frac{1}{37}} + \frac{(250 - 500 \cdot \frac{1}{37})^2}{500 \cdot \frac{1}{37}} + \frac{(12 - 500 \cdot \frac{1}{37})^2}{500 \cdot \frac{1}{37}}$$
$$\approx 0.47$$

$$\therefore p\text{-value} = P(\chi^2(2) \geq 0.47) \approx 0.79$$

\therefore The hypothesis can only be rejected with a 20% confidence level.