Question

In a hospital 60% of the patients are married. What's the probability that a sample of one ward with 8 patients, had 3 married?

Solution

In this problem we have the binomial distribution with the following parameters (see https://en.wikipedia.org/wiki/Binomial_distribution):

$$n = 8, \ p = 0.6, \ q = 1 - p = 0.4.$$

Then the required probability is

$$Pr(3; 8; \ 0.6) = \binom{8}{3} \cdot (0.6)^3 \cdot (0.4)^5 = \frac{8!}{3! \cdot 5!} \cdot 0.216 \cdot 0.01024 = 0.12386304 \approx 0.124.$$

Answer: 0.124.