

Example: A quality control inspector randomly draws a sample of 15 light bulbs from a recent production lot. Suppose it is known that 10 percent of the bulbs in the lot are defective. Let the random variable X be the number of defective light bulbs in the sample. Assume that the population from which the random drawings are made is very large so that the percent of defective items remains approximately constant.

- a. Is the binomial distribution an appropriate model for the probability distribution of X ? Yes or no? Justify your answer.

b. Identify n and p .

c. Calculate μ , σ^2 , and σ .

For 2–10, calculate μ , σ^2 , and σ for a binomial distribution with n repeated trials and probability p of success as indicated.

1. $n = 8, p = 0.2$

2. $n = 15, p = 0.9$

3. $n = 3, p = 0.25$

4. $n = 100, p = 0.5$

5. $n = 20, p = 0.15$

6. $n = 150, p = 0.9$

7. $n = 300, p = 0.25$

8. $n = 475, p = 0.55$

9. $n = 800, p = 0.7$

10. $n = 500, p = 0.35$