

Worksheet: Binomial Distribution

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

- _____ 1. Which of the following is not a property of a Binomial Experiment?
- All trials are identical.
 - Each trial has only two possible outcomes.
 - The probability of success may change from trial to trial.
 - The purpose of the experiment is to determine the number of successes that occurs during the n trials.
- _____ 2. In the expression $\binom{8}{3}(0.2)^3(0.8)^5$, which value represents the number of trials?
- 2
 - 3
 - 5
 - 8
- _____ 3. In the expression $\binom{7}{2}(0.4)^2(0.6)^5$, which value represents the probability of failure?
- 0.6
 - 0.4
 - $(0.4)^2$
 - $(0.6)^5$
- _____ 4. In the expression $\binom{10}{3}(0.5)^3(0.5)^7$, which value represents the number of successes?
- 3
 - 10
 - 5
 - 7
- _____ 5. Which expression describes the probability of k "3s" being rolled on 20 successive rolls of a six-sided die?
- $\binom{20}{k}\left(\frac{1}{6}\right)^k\left(\frac{5}{6}\right)^{20-k}$
 - $\binom{20}{k}\left(\frac{5}{6}\right)^k\left(\frac{1}{6}\right)^{20-k}$
 - $\binom{20}{k}\left(\frac{3}{6}\right)^k\left(\frac{3}{6}\right)^{20-k}$
 - $\binom{20}{3}\left(\frac{1}{6}\right)^3\left(\frac{5}{6}\right)^{17}$
- _____ 6. The probability of a computer memory chip being defective is 0.02. Which of the following statements is true?
- In a shipment of 100 chips, two will be defective.
 - The expected number of defective chips in a shipment of 500 is ten.
 - In a shipment of 1000 chips, it is certain that at least one will be defective.
 - All statements above are false.
- _____ 7. A young couple plans to have a family with four children. Assuming that the behaviour of their first child does not cause them to alter their plans, what is the expected number of girls for their family?
- 2.5
 - 2.25
 - 2
 - 1.5

Short Answer

Binomial Distribution Practice Worksheet

Part A: Probability Problems

For each of the following, identify the distribution as binomial, then compute the requested probabilities.

1. A die is rolled 6 times. The probability of rolling a "4" on a single roll is $\frac{1}{6}$. Let X = the number of times a "4" is rolled.
2. (a) Find $P(X = 2)$.
3. (b) Find $P(X \geq 3)$.
4. A multiple-choice quiz has 10 questions, each with 4 answer choices, and a student guesses on each question. Let X = the number of correct answers.
5. (a) Find $P(X = 5)$.
6. (b) Find $P(X \leq 2)$.
7. A lightbulb manufacturer knows that 90% of bulbs work without defects. A sample of 8 bulbs is tested. Let X = the number of bulbs that work.
8. (a) Find $P(X = 8)$.
9. (b) Find $P(X \geq 6)$.
10. In a survey, 70% of people prefer chocolate ice cream over vanilla. If 12 people are asked independently, let X = the number who prefer chocolate.
11. (a) Find $P(X = 9)$.
12. (b) Find $P(X \geq 10)$.
13. A factory machine produces items with a 95% chance of being non-defective. If 15 items are inspected, let X = the number of non-defective items.
14. (a) Find $P(X = 14)$.
15. (b) Find $P(X \leq 13)$.