

AP Statistics - Binomial and Geometric Distributions - Test

Common Core AP STAT 4.10, AP STAT 4.11, AP STAT 4.12, HSS-MD.A.3, HSS-CP.B.9 · maths-pdf.fr/en/

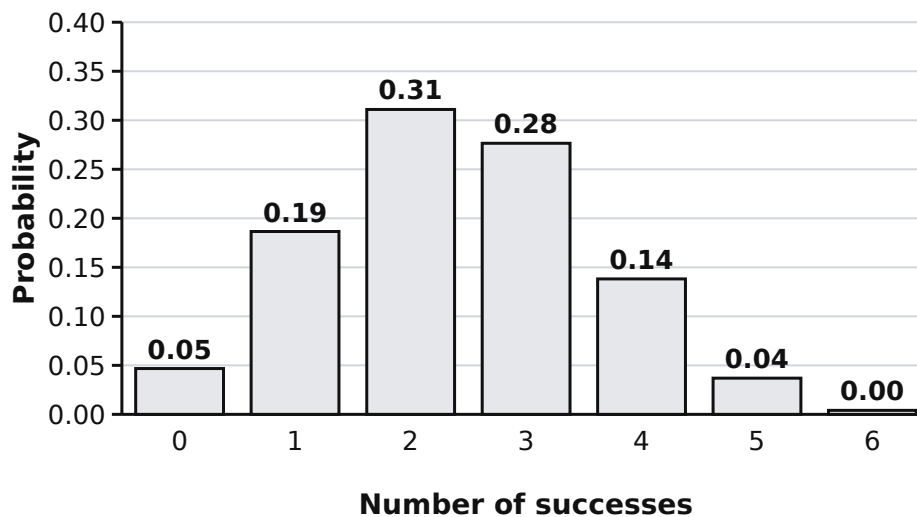
Name: _____ Class: _____ Date: ____/____/____

This 45-minute test covers the binomial and geometric settings, probabilities, means, and standard deviations. State the distribution and its parameters before every calculation.

About this test

- Grade: AP Statistics
- Chapter: Binomial and Geometric Distributions
- Standards: AP STAT 4.10, AP STAT 4.11, AP STAT 4.12, HSS-MD.A.3, HSS-CP.B.9
- Time: 45 minutes
- Total: 20 points

Question 1 - Binomial probability [4 pts]



Binomial with $n = 6$ and $p = 0.4$.

X is the number of successes in 6 trials with $p = 0.4$. (a) Find $P(X = 2)$. (1 point) (b) Find $P(X \geq 4)$. (2 points) (c) Find the mean. (1 point)

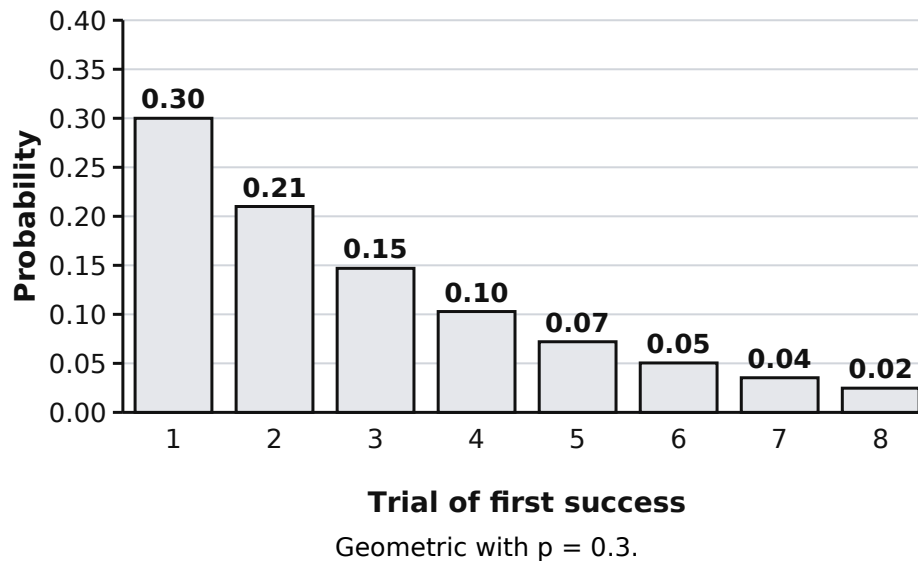
Question 2 - BINS [3 pts]

A basketball player takes 15 shots, each with probability 0.45 of success. (a) Explain why X , the number made, is binomial by checking all BINS conditions. (2 points) (b) Find $P(X = 7)$. (1 point)

Question 3 - Mean and sd [2 pts]

A multiple-choice quiz has 20 questions with 5 options each. A student guesses on every question. Find the mean and standard deviation of the number correct.

Question 4 - Geometric [3 pts]

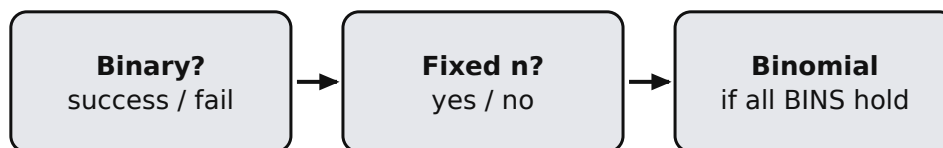


Each game of a carnival has a 30% chance of winning a prize. (a) Find the probability that the first win is on the 3rd game. (1 point) (b) Find the probability that more than 4 games are needed. (1 point) (c) Find the expected number of games. (1 point)

Question 5 - Unusual outcome [2 pts]

A drug works for 85% of patients. In a sample of 20 patients, only 12 improved. Compute $P(X \leq 12)$ and decide whether this result is unusual if the 85% claim is true.

Question 6 - Fixed number [1 pt]



BINS check.

Which BINS condition fails when cards are drawn from a deck until an ace appears?

Question 7 - Choose the model [2 pts]

For each situation, name the distribution (binomial or geometric) and its parameters: (a) The number of 6s in 12 rolls of a die. (b) The number of rolls until the first 6.

Question 8 - 10 percent condition [3 pts]

A bag of 40 marbles has 10 red. Five marbles are drawn without replacement. (a) Can the number of red marbles be modeled as binomial? Explain. (2 points) (b) Give a rough probability of exactly 2 red using a binomial model with $p = 0.25$. (1 point)