

AP Statistics · Probability and Random Variables · Test

Common Core AP Statistics Unit 2 (2026-27) · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This ap statistics probability test checks probability and random variables in 45 minutes, with 8 questions for a total of 20 points.

This test has 8 free-response questions worth 20 points in total and takes about 45 minutes. Show your work, give probabilities as decimals or fractions, and explain conclusions in context. A calculator is allowed. Questions 1 and 2 use the same table.

Test information

- **Grade:** AP Statistics
- **Chapter:** Probability and Random Variables
- **Common Core:** AP Statistics Unit 2 (2026-27)
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 3 pts; Question 2: 2 pts; Question 3: 2 pts; Question 4: 3 pts; Question 5: 2 pts; Question 6: 3 pts; Question 7: 2 pts; Question 8: 3 pts)

AP Statistics Probability Test: questions 1-5

Question 1: Gym members (3 points)

A gym classified 300 members by the time of day they usually visit and their main activity.

Time	Cardio	Weights	Classes	Total
Morning	60	45	30	135
Evening	45	90	30	165
Total	105	135	60	300

Gym members by time and activity.

- a. Find the probability that a randomly chosen member visits in the evening and mainly lifts weights. (1 point)

- b. Find the probability that a randomly chosen member mainly does cardio. (1 point)
- c. Given that a member mainly takes classes, find the probability that the member visits in the morning. (1 point)

Question 2: Time and activity (2 points)

Use the table of 300 gym members from Question 1 (morning: 60 cardio, 45 weights, 30 classes; evening: 45 cardio, 90 weights, 30 classes).

- a. Find $P(\text{weights})$ and $P(\text{weights}|\text{morning})$. (1 point)
- b. Are the events “mainly lifts weights” and “visits in the morning” independent? Justify your answer. (1 point)

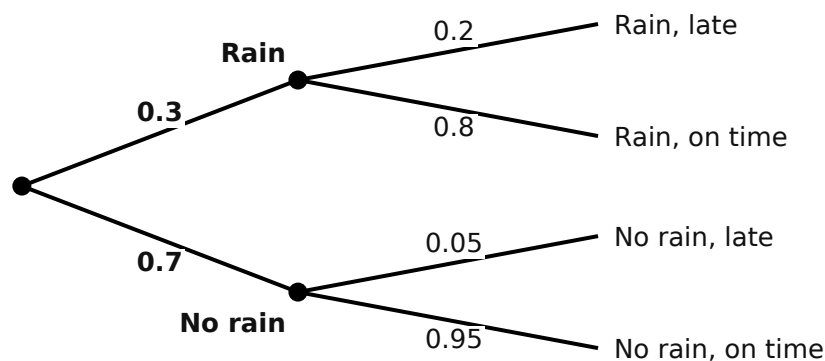
Question 3: Bakery customers (2 points)

At a bakery, 55% of customers buy bread, 30% buy muffins, and 70% buy bread or muffins (or both).

- a. Find the probability that a customer buys both. (1 point)
- b. Are buying bread and buying muffins mutually exclusive? Are they independent? Justify both answers. (1 point)

Question 4: Late bus (3 points)

The probability that it rains on a school day is 0.3. Jamal’s bus is late with probability 0.2 on a rainy day and with probability 0.05 on a day without rain.



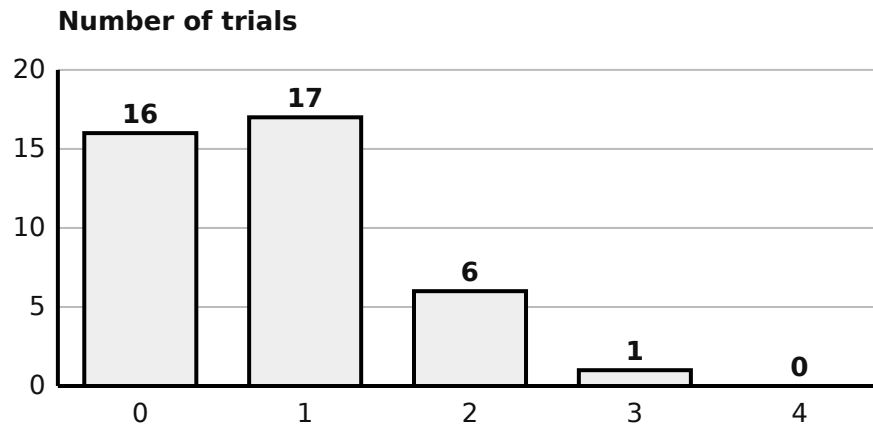
The branches of the situation.

- a. Find the probability that it rains and the bus is late. (1 point)
- b. Find the probability that the bus is late. (1 point)
- c. Given that the bus is late, find the probability that it rained. (1 point)

Question 5: Guessing on a quiz (2 points)

A quiz has 4 questions, each with 5 answer choices, and a student guesses every answer.

- Describe how to simulate one trial using random digits. (1 point)
- The student's number of correct answers was simulated in 40 trials (see the figure). Estimate the probability of getting at least 2 correct. (1 point)



Simulated number correct, 40 trials.

AP Statistics Probability Test: questions 6-8

Question 6: Online orders (3 points)

The number of online orders X a small shop receives in one hour has the distribution below.

x	0	1	2	3	4
$P(X = x)$	0.10	0.25	0.35	k	0.10

Distribution of X .

- Find the value of k . (1 point)
- Find the mean of X . (1 point)
- Find the standard deviation of X . (1 point)

Question 7: Carnival wheel (2 points)

A carnival wheel has 8 equal sections: 1 pays \$20, 2 pay \$5, and 5 pay nothing. It costs \$4 to spin.

- Find the mean winnings per spin. (1 point)
- Find the mean net gain per spin and interpret it in context. (1 point)

Question 8: Socks (3 points)

A drawer holds 6 black socks and 4 white socks. Two socks are drawn at random without replacement.

- a. Find the probability that both socks are black. (1 point)
- b. Find the probability that exactly one sock is black. (1 point)
- c. Are the events “first sock is black” and “second sock is black” independent? Justify. (1 point)

How to use this ap statistics probability test

Take this ap statistics probability test without notes, then grade it with the test answer key out of 20 points.

