

AP Statistics · Probability and Random Variables · Test Answer Key

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

This ap statistics probability test answer key gives the full solution and the scoring guide for each of the 8 test questions on probability and random variables.

Each question is solved in full with a scoring guide. On the AP exam, a probability answer needs a correct setup, not only a number, so award a point when the notation or the formula shows how the answer was found. Interpretations must refer to the context.

AP StatisticsCommon Core: AP Statistics Unit 2 (2026-27)

AP Statistics Probability Test Answer Key: questions 1-5

Question 1: Gym members (3 points)

- a. Joint: $\frac{90}{300} = 0.30$.
- b. Marginal: $\frac{105}{300} = 0.35$.
- c. Conditional on the 60 class members: $\frac{30}{60} = 0.50$.

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

Shaded cells used in parts (a), (b) and (c).

Scoring: 1 point each. (a) 0.30 from 90 over 300. (b) 0.35 from the column total. (c) 0.50, with denominator 60 and not 300.

Question 2: Time and activity (2 points)

- a. $P(\text{weights}) = \frac{135}{300} = 0.45$ and $P(\text{weights}|\text{morning}) = \frac{45}{135} \approx 0.333$.
- b. The probabilities differ (0.45 versus 0.333), so **the events are not independent**: knowing a member visits in the morning changes the probability that the member lifts weights.

Scoring: (a) 1 point for both values. (b) 1 point for “not independent” with a comparison of the two probabilities.

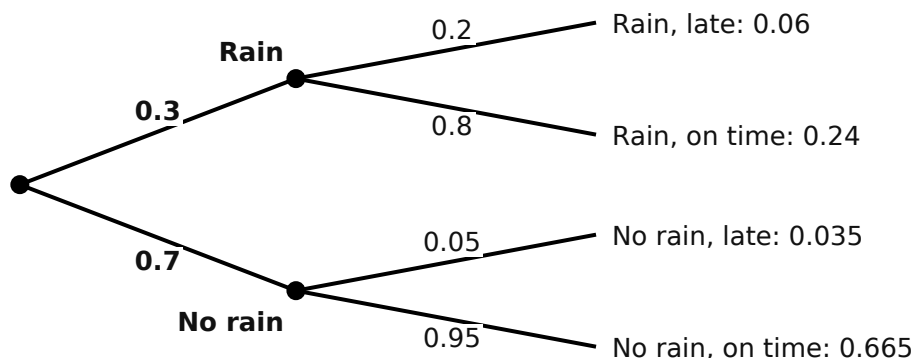
Question 3: Bakery customers (2 points)

- a. $P(\text{both}) = 0.55 + 0.30 - 0.70 = 0.15$.
- b. Since $0.15 \neq 0$, the events **are not mutually exclusive**. Since $0.55 \times 0.30 = 0.165 \neq 0.15$, they **are not independent**.

Scoring: (a) 1 point. (b) 1 point for both conclusions with the supporting calculation.

Question 4: Late bus (3 points)

- a. $P(\text{rain and late}) = 0.3 \times 0.2 = 0.06$.
- b. $P(\text{late}) = 0.06 + 0.7 \times 0.05 = 0.06 + 0.035 = 0.095$.
- c. $P(\text{rain}|\text{late}) = \frac{0.06}{0.095} \approx 0.632$.



Joint probabilities on the tree.

Scoring: (a) 1 point for the product. (b) 1 point for adding both late branches. (c) 1 point for conditional probability as a ratio, 0.632.

Question 5: Guessing on a quiz (2 points)

- a. Let digits 0 and 1 mean a correct guess (2 of 10 digits = 20%) and 2 to 9 an incorrect guess. Read 4 digits per trial and count the correct guesses; repeat many times.
- b. At least 2 correct occurred in $6+1+0=7$ of 40 trials: $\frac{7}{40} = 0.175$.

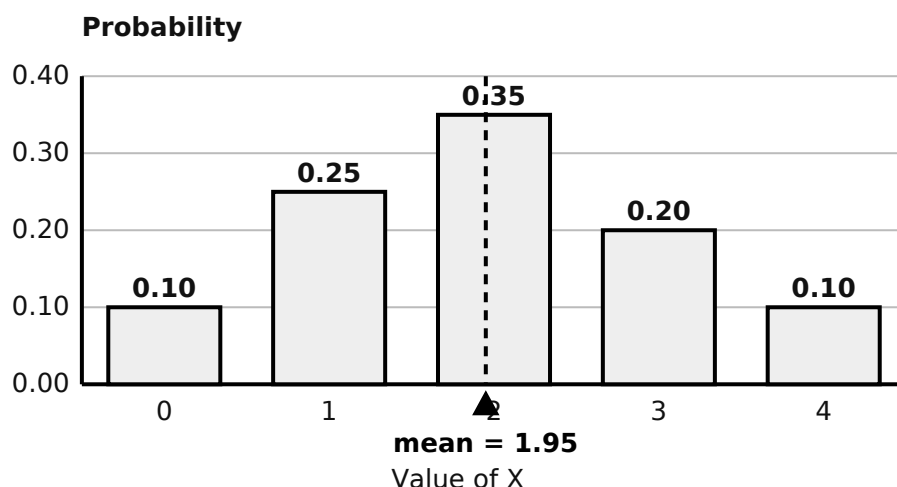
Scoring: (a) 1 point for a digit assignment with the correct 20% and 4 digits per trial. (b) 1 point for 7 out of 40 = 0.175.

AP Statistics Probability Test Answer Key: questions 6-8

Question 6: Online orders (3 points)

- a. $0.10 + 0.25 + 0.35 + k + 0.10 = 1$, so $k = 0.20$.
- b. $\mu_X = 0 + 0.25 + 0.70 + 0.60 + 0.40 = 1.95$ orders.
- c. $\sigma_X^2 = (1.95)^2(0.10) + (0.95)^2(0.25) + (0.05)^2(0.35) + (1.05)^2(0.20) + (2.05)^2(0.10) = 0.38025 + 0.225625 + 0.000875 + 0.2205 + 0.42025 = 1.2475$

, so $\sigma_X \approx 1.12$ orders.



Completed distribution with the mean marked.

Scoring: 1 point each. (a) 0.20. (b) 1.95 with the sum of products. (c) 1.12, with correct weighted squared deviations.

Question 7: Carnival wheel (2 points)

- $\mu = 20 \cdot \frac{1}{8} + 5 \cdot \frac{2}{8} + 0 \cdot \frac{5}{8} = 2.50 + 1.25 = 3.75$ dollars.
- $3.75 - 4 = -\$0.25$. Over many spins, a player loses on average \$0.25 per spin.

Scoring: (a) 1 point for 3.75. (b) 1 point for $-\$0.25$ with an interpretation as a long-run average per spin.

Question 8: Socks (3 points)

- $\frac{6}{10} \cdot \frac{5}{9} = \frac{30}{90} = \frac{1}{3}$.
- $\frac{6}{10} \cdot \frac{4}{9} + \frac{4}{10} \cdot \frac{6}{9} = \frac{24}{90} + \frac{24}{90} = \frac{48}{90} = \frac{8}{15} \approx 0.533$.
- $P(\text{second black}) = \frac{6}{10} = 0.6$ but $P(\text{second black} | \text{first black}) = \frac{5}{9} \approx 0.556$. The probabilities differ, so **the events are not independent**.

Scoring: (a) 1 point for $1/3$. (b) 1 point for adding both orders, $8/15$. (c) 1 point for comparing the two probabilities and concluding not independent.

Scoring summary

Total
20 points: add the points of every question of this ap statistics probability test answer key.

How to use this ap statistics probability test answer key

Use this ap statistics probability test answer key to score the test fairly and to see which skills need more practice.

