

AP Statistics · Binomial and Normal Distributions · Test Answer Key

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

This ap statistics binomial test answer key gives the full solution and the scoring guide for each of the 8 test questions on binomial and normal distributions.

Each solution shows the full setup followed by a scoring guide that awards the points. Award partial credit when the method is correct but arithmetic or rounding is slightly off, and require context in every conclusion, as on the AP exam.

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

AP Statistics Binomial Test Answer Key: questions 1-5

Question 1: Binomial setting (2 points)

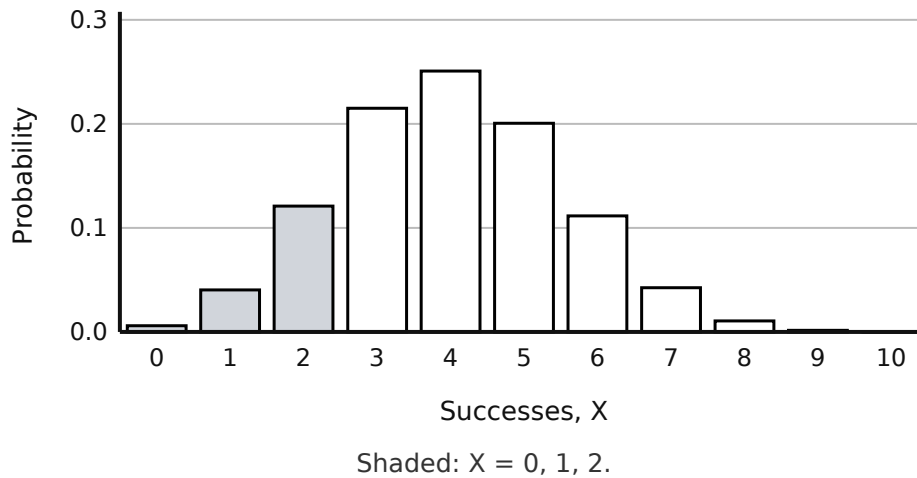
Binary: each student walks or does not. Independent: the sample of 25 is less than 10% of 2,400 (the limit is 240), so the trials are approximately independent. Number fixed: $n = 25$. Same probability: $p = 0.30$ for each randomly chosen student.

X is binomial with $n = 25$, $p = 0.30$.

Scoring: 1 point for justifying the BINS conditions, including the 10% condition for independence; 1 point for $n = 25$ and $p = 0.30$.

Question 2: Binomial probabilities (3 points)

- a. $P(X = 4) = {}_{10}C_4(0.4)^4(0.6)^6 = 210(0.0256)(0.046656) \approx \mathbf{0.2508}$
- b. $P(X \leq 2) = P(0) + P(1) + P(2) = 0.0060 + 0.0403 + 0.1209 \approx \mathbf{0.1673}$ (the shaded bars)
- c. $P(X \geq 3) = 1 - P(X \leq 2) = 1 - 0.1673 = \mathbf{0.8327}$



Scoring: 1 point per part, correct setup and value. For (c), 1 point requires use of the complement or a correct sum.

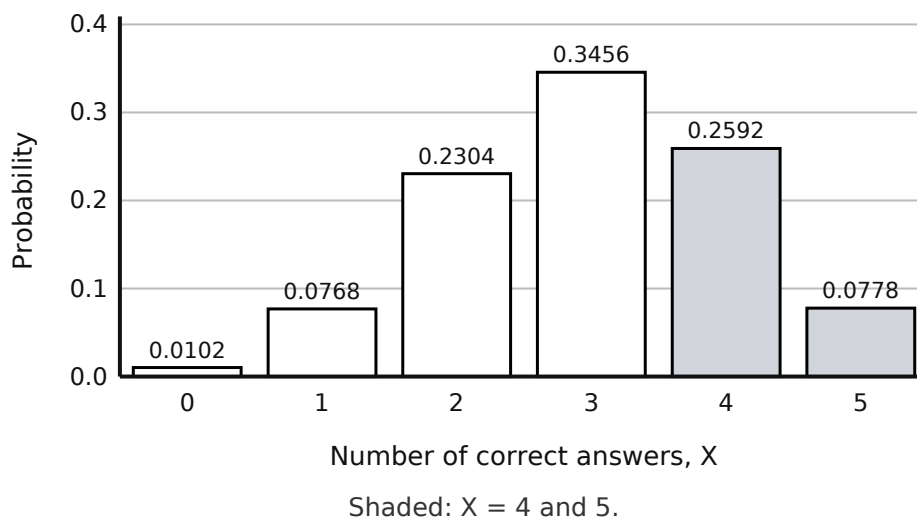
Question 3: Mean and spread (2 points)

- $\mu = 300(0.2) = 60$; $\sigma = \sqrt{300(0.2)(0.8)} = \sqrt{48} \approx 6.928$.
- $60 \pm 2(6.928)$ gives about 46.1 to 73.9. Roughly 95% of days with 300 emails should have between about 46 and 74 spam emails.

Scoring: (a) 1 point for both values; (b) 1 point for the interval and a context statement.

Question 4: Reading a binomial graph (2 points)

- The tallest bar is at $X = 3$, with probability **0.3456**.
- $P(X \geq 4) = 0.2592 + 0.0778 = \mathbf{0.3370}$.

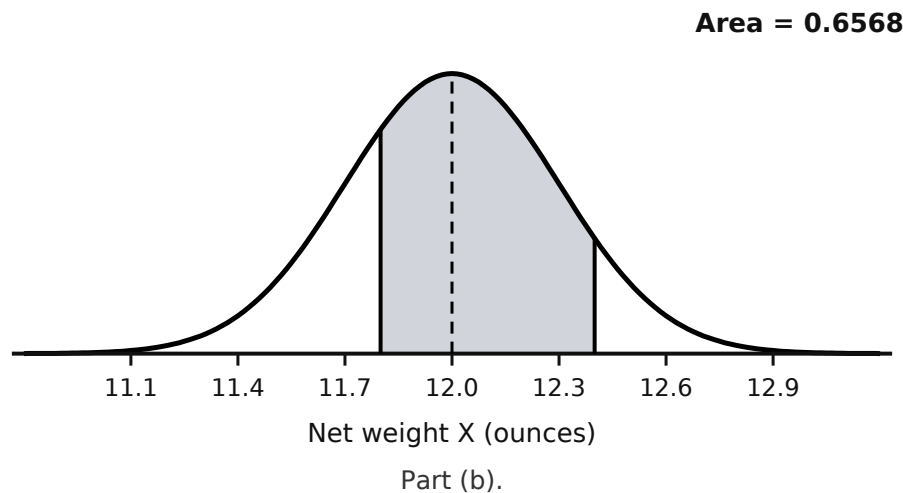


Scoring: (a) 1 point for 3 and its probability; (b) 1 point for adding the two bars.

Question 5: Normal probabilities (3 points)

a. $z = \frac{11.5 - 12.0}{0.3} = -1.67$; area to the left is **0.0475**.

b. $z_1 = \frac{11.8 - 12.0}{0.3} = -0.67$ (area 0.2514) and $z_2 = \frac{12.4 - 12.0}{0.3} = 1.33$ (area 0.9082). The proportion is $0.9082 - 0.2514 = \mathbf{0.6568}$.



Scoring: (a) 1 point. (b) 1 point for both z-scores, 1 point for subtracting the areas to get 0.6568.

AP Statistics Binomial Test Answer Key: questions 6-8

Question 6: Percentile cutoff (2 points)

The cutoff has 95% of the area to its left, so $z \approx 1.645$.

$x = 250 + 1.645(40) = 250 + 65.8 = \mathbf{315.8 \text{ milliseconds}}$.

Scoring: 1 point for the correct z-score; 1 point for converting to a time with the correct units.

Question 7: Comparing z-scores (2 points)

Reading: $z = \frac{68 - 60}{5} = 1.6$. Science: $z = \frac{590 - 520}{50} = 1.4$.

Reading, because $1.6 > 1.4$: his reading score is farther above its mean in standard-deviation units.

Scoring: 1 point for both z-scores, 1 point for the correct conclusion with justification.

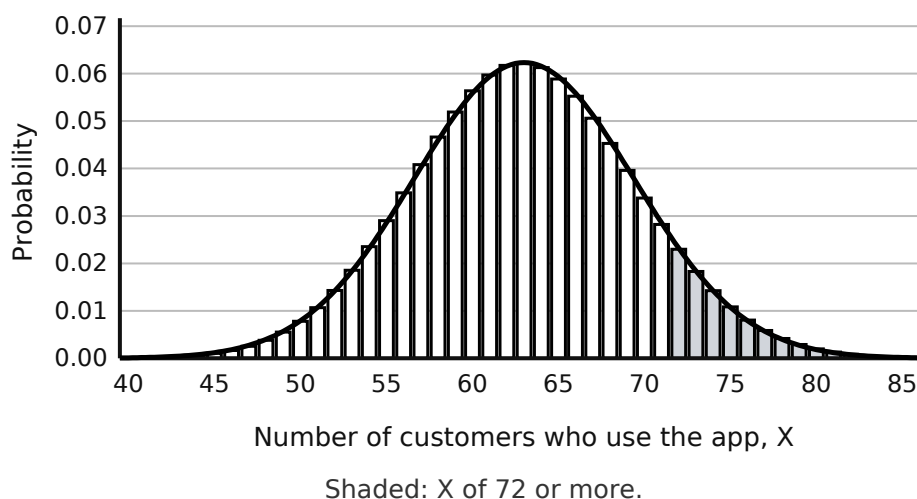
Question 8: Normal approximation (4 points)

a. $np = 180(0.35) = 63 \geq 10$ and $n(1-p) = 180(0.65) = 117 \geq 10$.

b. $\mu = 63$; $\sigma = \sqrt{180(0.35)(0.65)} = \sqrt{40.95} \approx 6.399$.

c. $z = \frac{72-63}{6.399} = 1.41$; $P(X \geq 72) \approx 1 - 0.9207 = \mathbf{0.0793}$.

d. It is somewhat uncommon (about 7.9% of days) but not very unusual: $z = 1.41$ is inside 2 standard deviations of the mean.



Scoring: (a) 1 point for both checks; (b) 1 point; (c) 1 point for standardizing and correct tail area; (d) 1 point for a conclusion supported by the probability or z-score.

Scoring summary

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

How to use this ap statistics binomial test answer key

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

