

AP Statistics · Binomial and Normal Distributions · Quiz

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

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

This ap statistics binomial normal quiz asks 10 multiple-choice questions on binomial and normal distributions, and each answer comes with a short explanation.

Ten multiple-choice questions check the core ideas of binomial and normal distributions: the BINS conditions, binomial probabilities, z-scores, normal areas and when a normal approximation is reasonable. Each question has exactly one correct answer. Work out the answer first, then read the explanation.

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

Questions

Question 1

Which situation is a binomial setting?

- A. Counting the number of aces in a 5-card hand dealt from one standard deck
- B. Counting the number of defective items in a random sample of 20 items from a very large production run, with 4% defective overall
- C. Counting the number of rolls of a die needed to get the first 3
- D. Counting the number of heads when a coin is flipped 10 times, where each flip is adjusted to be 5% more likely than the last

Question 2

X is binomial with $n = 12$ and $p = 0.25$. What is the standard deviation of X?

- A. 2.25
- B. 3
- C. 0.75
- D. 1.5

Question 3

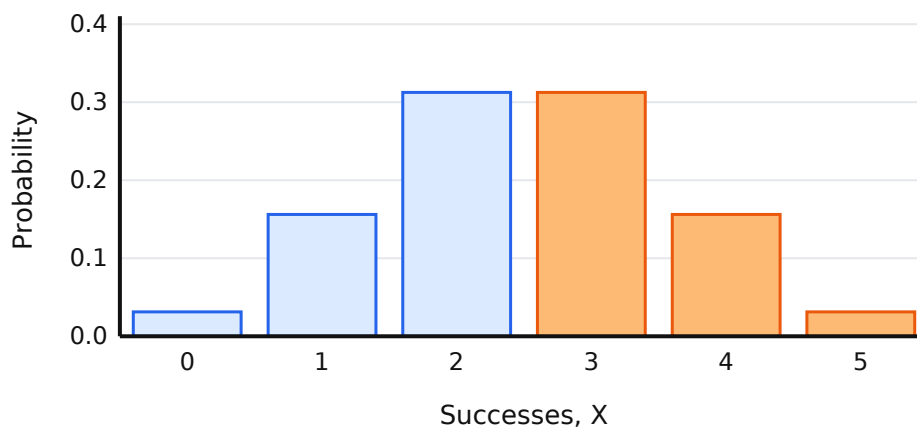
X is binomial with $n = 4$ and $p = 0.5$. What is $P(X = 2)$?

- A. 0.25
- B. 0.5

- C. 0.375
- D. 0.1875

Question 4

The graph shows a binomial distribution with $n = 5$ and $p = 0.5$. The highlighted bars are $X = 3, 4$ and 5 . What is $P(X \geq 3)$?



Binomial, $n = 5$, $p = 0.5$.

- A. 0.3125
- B. 0.5
- C. 0.1875
- D. 0.8125

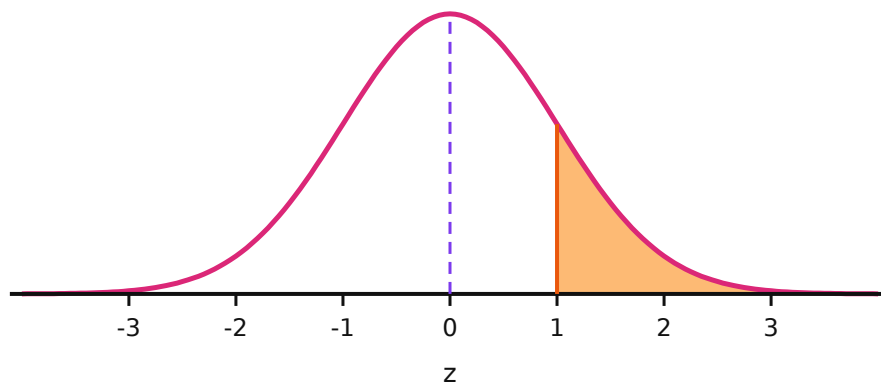
Question 5

A student has a z-score of 1.5 on a test with mean 70 and standard deviation 8. What is the score?

- A. 12
- B. 62
- C. 82
- D. 78

Question 6

For a standard normal variable Z , what is the shaded area, $P(Z > 1)$?



Standard normal curve.

- A. 0.1587
- B. 0.8413
- C. 0.3174
- D. 0.6826

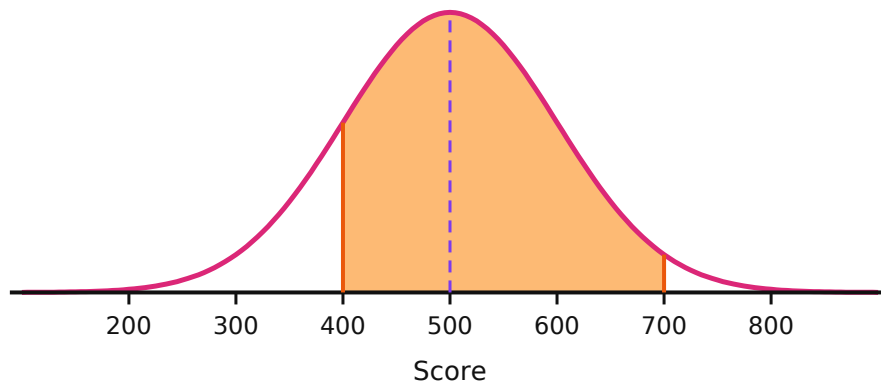
Question 7

For which pair of values is the normal approximation to the binomial distribution reasonable?

- A. $n = 40, p = 0.1$
- B. $n = 25, p = 0.3$
- C. $n = 200, p = 0.04$
- D. $n = 100, p = 0.5$

Question 8

Scores are approximately normal with mean 500 and standard deviation 100. By the 68-95-99.7 rule, about what percent of scores fall in the shaded region, from 400 to 700?



Shaded from 400 to 700.

- A. 81.5%
- B. 95%

- C. 68%
- D. 84%

Question 9

A fair-looking spinner lands on red with probability 0.2 on each independent spin. What is the probability of at least one red in 6 spins?

- A. 0.2621
- B. 0.7379
- C. 0.6723
- D. 0.8000

Question 10

Quiz scores are approximately normal with mean 60 and standard deviation 5. What score is at the 90th percentile?

- A. 53.6
- B. 68.2
- C. 66.4
- D. 65.0

Answer key

1. **B** - Only the first has two outcomes, independent trials, a fixed n and constant p . Card dealing is dependent, waiting for a first success has no fixed n , and a changing probability breaks the same- p condition.
2. **D** - The standard deviation is the square root of $np(1-p) = 12(0.25)(0.75) = 2.25$, so 1.5. The value 2.25 is the variance and 3 is the mean.
3. **C** - $P(X = 2) = 6(0.5)^2(0.5)^6 = 6/16 = 0.375$. Forgetting the 6 ways to arrange the successes gives 0.0625; 0.1875 is $3/16$.
4. **B** - The bars have heights $10/32$, $5/32$ and $1/32$, which total $16/32 = 0.5$. Using only the bar at 3 gives 0.3125.
5. **C** - $x = \text{mean} + z(\text{sd}) = 70 + 1.5(8) = 82$. Using z alone as the distance gives 71.5; 78 comes from adding one SD; 62 would be $z = -1$.
6. **A** - The area to the left of $z = 1$ is 0.8413, so the right tail is $1 - 0.8413 = 0.1587$. The value 0.8413 forgets to subtract; 0.3174 counts both tails.
7. **D** - Both np and $n(1-p)$ must be at least 10. For $n = 100$ and $p = 0.5$ they are 50 and 50. The others give $np = 4$, 7.5 and 8.
8. **A** - The region runs from 1 SD below to 2 SD above the mean: $34\% + 47.5\% = 81.5\%$. The values 68% and 95% each count a symmetric region only.
9. **B** - Use the complement: $1 - (0.8)^6 = 1 - 0.2621 = 0.7379$. The value 0.2621 is the probability of no reds.
10. **C** - The 90th percentile has $z = 1.28$, so $x = 60 + 1.28(5) = 66.4$. The value 68.2 uses $z = 1.645$, which is the 95th percentile.

How does this quiz work?

Read each question, choose one answer among A, B, C and D, then check it: a short explanation appears after every answer. Your score out of 10 is shown at the end, and you can restart the quiz as often as you like.

What should you review before the quiz?

Reread the key facts of the lesson and the worked example. If a question is hard, go back to the matching part of the lesson, then try the quiz again. Write your work on scrap paper: most mistakes come from skipping a step, not from the idea itself.

Remember:

- Binomial setting: Binary outcomes, Independent trials, Number of trials fixed, Same probability of success (BINS).
- For a binomial count: $\mu = np$ and $\sigma = \sqrt{np(1-p)}$.
- Normal probabilities are areas: standardize with $z = \frac{x-\mu}{\sigma}$, then use Table A or

normalcdf.

- Percentiles run backward: $x = \mu + z\sigma$, with z from the table or invNorm.
- Normal approximation to a binomial needs $np \geq 10$ and $n(1-p) \geq 10$.

How to use this ap statistics binomial normal quiz

Retake this ap statistics binomial normal quiz until every answer is right, then move on to the worksheet and the test.

