

AP Statistics · Binomial and Normal Distributions · Worksheet

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

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

This ap statistics binomial normal worksheet gives 24 problems on binomial and normal distributions, ordered from easy to hard, with a separate answer key.

These problems practice the two main models of AP Statistics Unit 2 (2026-27): the binomial distribution and the normal distribution. You will check the BINS conditions, find binomial probabilities, means and standard deviations, and use z-scores and areas under the normal curve.

The last problems combine skills, including normal approximations to binomial counts and judging whether a result is unusual. Show your setup, and round probabilities to four decimal places.

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

AP Statistics Binomial Normal Worksheet: problems 1-5

Problem 1: Coin flips

Jamal flips a fair coin 12 times and lets X be the number of heads. Decide whether X is a binomial random variable. If it is, state n and p .

Problem 2: Cards without replacement

Sofia deals 10 cards from a well-shuffled standard 52-card deck without putting any back. Let X be the number of hearts. Explain why X is not binomial.

Problem 3: Rolling until a six

Ethan rolls a fair die until a 6 appears and lets X be the number of rolls. Explain why X is not binomial.

Problem 4: Exactly three successes

A multiple-choice quiz has 8 questions, each with four choices. Liam guesses on every question, so $X \sim$ binomial with $n=8$ and $p=0.25$. Find $P(X=3)$.

Problem 5: No successes

Priya plants 6 seeds that each sprout with probability 0.9. Let X be the number that fail to

sprout, so $p=0.1$ for a failure. Find the probability that no seed fails.

AP Statistics Binomial Normal Worksheet: problems 6-10

Problem 6: At most two

Let X be binomial with $n=5$ and $p=0.4$. Find $P(X \leq 2)$.

Problem 7: At least one

A machine makes bolts and 5% are defective, independently. Mei checks 10 bolts. Find the probability that at least one is defective.

Problem 8: Mean and standard deviation

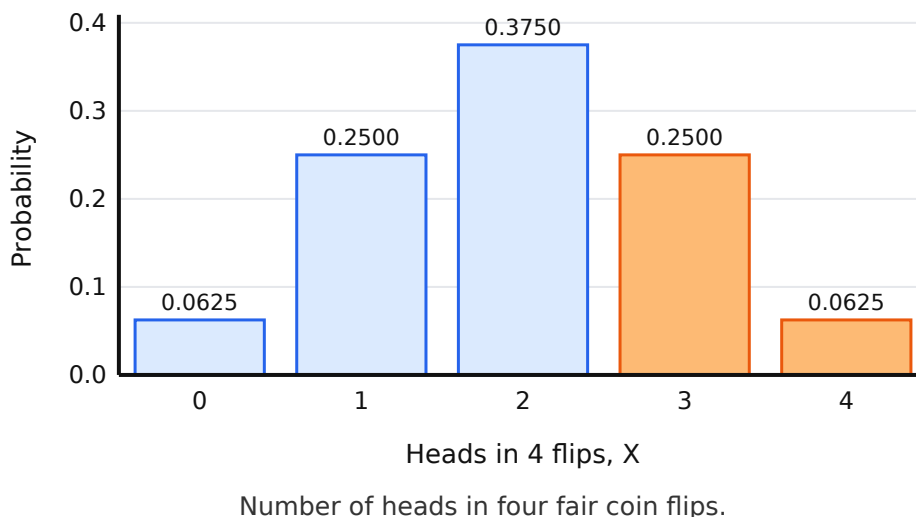
A binomial random variable has $n=40$ and $p=0.35$. Find its mean and standard deviation.

Problem 9: Interpreting the mean

A factory knows that 2% of phone cases are cracked. A shipment of 200 is inspected. Find the mean and standard deviation of the number of cracked cases, and interpret the mean in context.

Problem 10: Reading a distribution graph

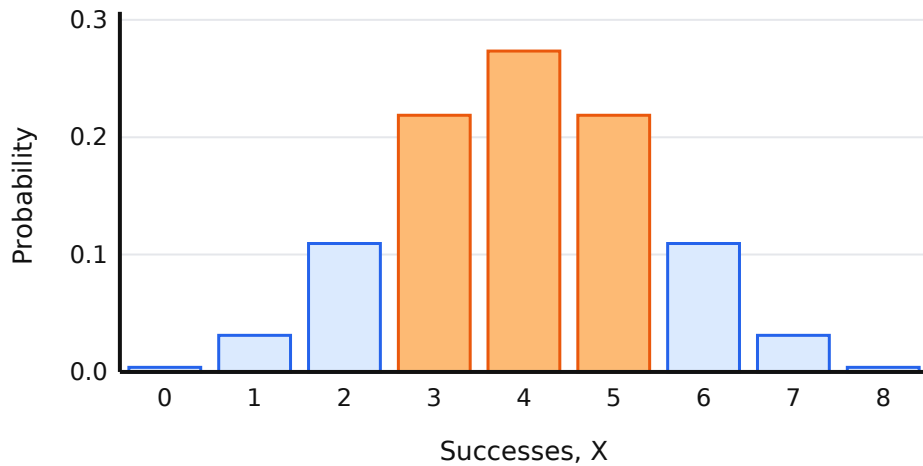
The graph shows the distribution of X , the number of heads in 4 fair coin flips. Use the graph to find $P(X \geq 3)$.



AP Statistics Binomial Normal Worksheet: problems 11-15

Problem 11: Probability of a middle range

Let X be binomial with $n=8$ and $p=0.5$, graphed below. Find $P(3 \leq X \leq 5)$.



Binomial distribution, $n = 8$, $p = 0.5$.

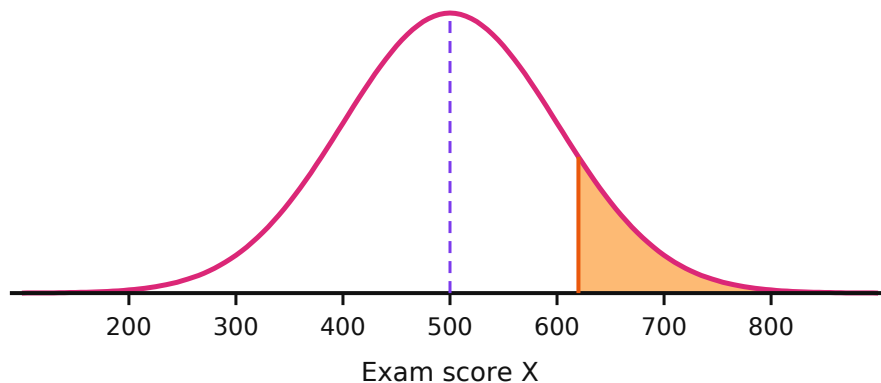
Problem 12: z-score of a height

Heights of adult men in a town are approximately normal with mean 69 inches and standard deviation 3 inches. Find the z-score of a man who is 75 inches tall and interpret it.

Problem 13: Area to the right

Scores on a college entrance exam are approximately normal with mean 500 and standard deviation 100. Find the proportion of students who score above 620.

$P(X > 620)$?

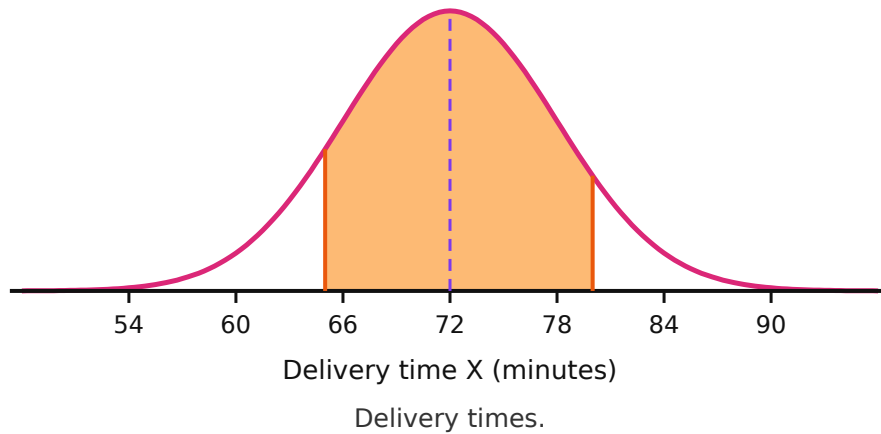


Shade the region above 620.

Problem 14: Area between two values

Pizza delivery times in a city are approximately normal with mean 72 minutes and standard deviation 6 minutes. Find the probability that an order arrives between 65 and 80 minutes.

$$P(65 < X < 80)?$$



Problem 15: Finding a percentile

IQ scores are approximately normal with mean 100 and standard deviation 15. What score marks the 90th percentile?

AP Statistics Binomial Normal Worksheet: problems 16-20

Problem 16: Empirical rule

Bags of flour are filled with a mean of 16.0 ounces and a standard deviation of 0.2 ounce, with a normal distribution. Use the 68-95-99.7 rule to find the percent of bags that (a) weigh between 15.6 and 16.4 ounces, and (b) weigh less than 15.8 ounces.

Problem 17: Comparing z-scores

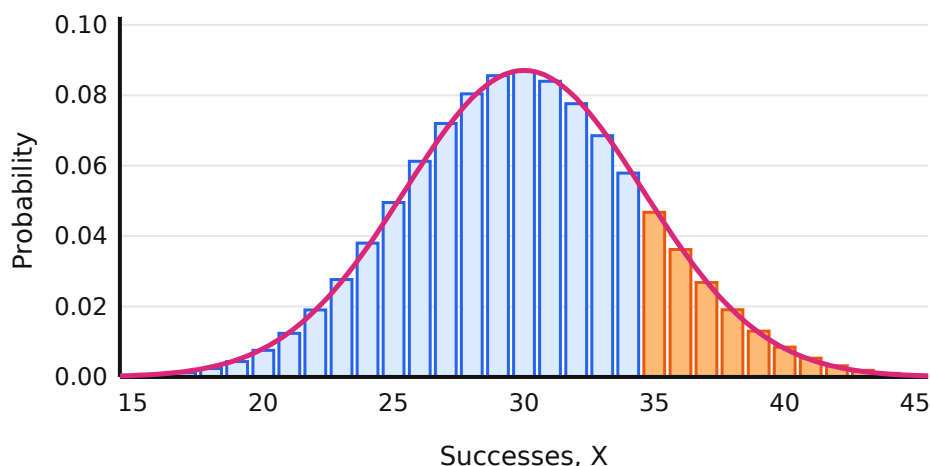
Maya scored 84 on a test with mean 75 and standard deviation 6. Diego scored 88 on a different test with mean 80 and standard deviation 8. Who did better relative to the class?

Problem 18: Checking the approximation

Decide whether the normal approximation to the binomial is reasonable for (a) $n=150$, $p=0.2$, and (b) $n=40$, $p=0.1$. Show the check.

Problem 19: Normal approximation

Let X be binomial with $n=100$ and $p=0.3$. (a) Check the conditions for a normal approximation. (b) Use the normal model to approximate $P(X \geq 35)$. (c) The exact binomial value is 0.1629. Why is the approximation smaller?



Binomial bars with the matching normal curve.

Problem 20: Free throws

Priya makes 70% of her free throws, independently. She shoots 15 free throws. Find the probability that she makes at least 12.

AP Statistics Binomial Normal Worksheet: problems 21-24

Problem 21: Overbooked flight

An airline sells 54 tickets for a flight with 50 seats. Each ticketed passenger shows up with probability 0.9, independently. Find the mean and standard deviation of the number who show up, and the probability that more than 50 show up.

Problem 22: Recovering n and p

A binomial random variable has mean 24 and variance 9.6. Find n and p .

Problem 23: Poll approximation

In a city, 45% of voters support a bond issue. A pollster surveys 200 randomly chosen voters (far fewer than 10% of the city). Use a normal approximation to find the probability that more than 100 of the sampled voters support it.

Problem 24: Is the claim believable?

A manufacturer claims that only 3% of its light bulbs are defective. An inspector tests 150 randomly chosen bulbs and finds 10 defective. (a) Find the mean and standard deviation of the number of defective bulbs if the claim is true. (b) Can a normal model be used to find $P(X \geq 10)$? (c) Find $P(X \geq 10)$ and decide whether the result casts doubt on the claim.

How to use this ap statistics binomial normal worksheet

Print this ap statistics binomial normal worksheet as a PDF, solve every problem on paper, then compare with the answer key.

