

AP Statistics · Inference for Proportions · Worksheet

Common Core AP Statistics Unit 3 (2026-27) · mathovore.fr

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

This ap statistics proportions worksheet gives 24 problems on inference for proportions, ordered from easy to hard, with a separate answer key.

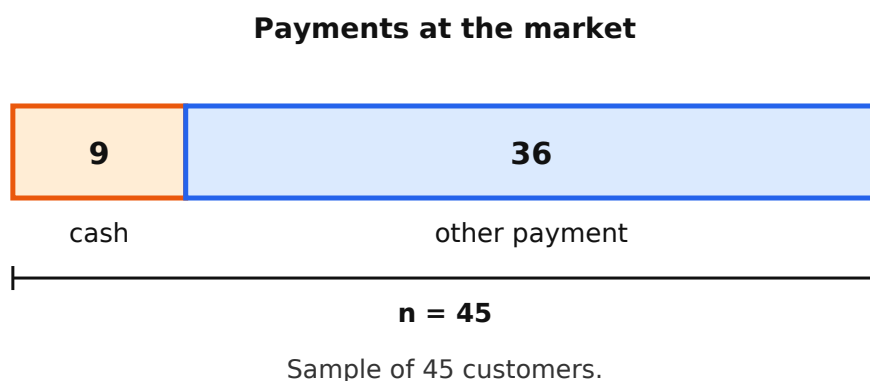
These 24 problems practice inference for proportions from the AP Statistics course: checking conditions, building and interpreting one-proportion and two-proportion intervals, choosing a sample size, running z tests, interpreting P-values, and describing Type I errors, Type II errors and power. Problems move from short skill checks to full four-step procedures.

AP StatisticsCommon Core: AP Statistics Unit 3 (2026-27)

AP Statistics Proportions Worksheet: problems 1-5

Problem 1: Large Counts check

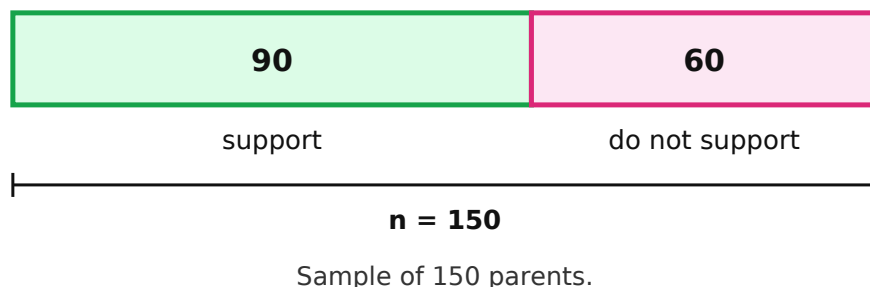
In a random sample of 45 customers at a farmers market, 9 paid with cash. Check whether the Large Counts condition is met for a confidence interval for the proportion of all customers who pay with cash.



Problem 2: Standard error of a proportion

In a random sample of 150 Little League parents, 90 support adding a pitch clock. Calculate the standard error of $\hat{p}$.

Pitch clock survey



Problem 3: Critical values

Find the critical value z^* for a 90%, a 95% and a 99% confidence interval for a proportion. Round to three decimal places.

Problem 4: One-proportion z interval

A random sample of 250 youth players in a regional league includes 85 who play a second sport. Assume the random and 10% conditions are met. Check Large Counts, then construct a 95% confidence interval for the proportion of all players in the league who play a second sport.

Problem 5: Interpreting an interval

The 95% confidence interval for the proportion of players in a regional league who play a second sport is $(0.281, 0.399)$. Interpret this interval in context.

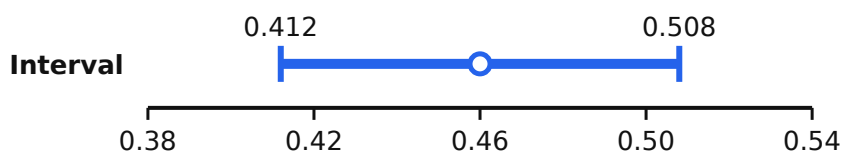
AP Statistics Proportions Worksheet: problems 6-10

Problem 6: Meaning of the confidence level

Priya writes: "There is a 95% chance that the true proportion of players who play a second sport is between 0.281 and 0.399." Identify the error in this statement and explain what 95% confidence actually describes.

Problem 7: Sample proportion and margin of error

A confidence interval for a proportion is $(0.412, 0.508)$. Find the sample proportion $\hat{p}$ and the margin of error.



A confidence interval for a proportion.

Problem 8: Effect of confidence level

In a random sample of 400 shoppers at a mall, 140 used a coupon. Construct a 90% and a 99% confidence interval for the proportion of all shoppers who use a coupon. Explain why the intervals differ in width.

Problem 9: Sample size without a prior estimate

A polling group wants a 95% confidence interval for a proportion with a margin of error of at most 0.03. No prior estimate of the proportion exists. Find the smallest sample size that guarantees this.

Problem 10: Sample size with a prior estimate

An earlier study found that about 30% of teenagers volunteer each month. Find the smallest sample size needed for a 99% confidence interval with a margin of error of at most 0.02, using the earlier estimate.

AP Statistics Proportions Worksheet: problems 11-15

Problem 11: Writing hypotheses

A battery company states that 8% of its batteries are defective. Ethan suspects the true proportion is greater than 8%. State the null and alternative hypotheses and define the parameter.

Problem 12: Right-tailed z test

A bakery claims that at most 10% of its muffins are underweight. Sofia suspects the rate is higher. In a random sample of 120 muffins, 18 are underweight. Perform a one-proportion z test: find the standardized test statistic and the P-value.

Problem 13: Two-sided z test

A school reports that 40% of its students ride the bus. Jamal thinks the percentage has changed. In a random sample of 180 students, 63 ride the bus. Find the test statistic and the

P-value for a two-sided test of $H_0:p=0.40$.

Problem 14: Interpreting a P-value

A test of $H_0:p=0.10$ versus $H_a:p>0.10$ for the share of underweight muffins, based on a sample with $\hat{p}=0.150$, gave a P-value of 0.034. Interpret this P-value in context.

Problem 15: Drawing a conclusion

The muffin test gave a P-value of 0.034. Use a significance level of $\alpha=0.05$ to state a conclusion in context. Then decide whether the conclusion would change at $\alpha=0.01$.

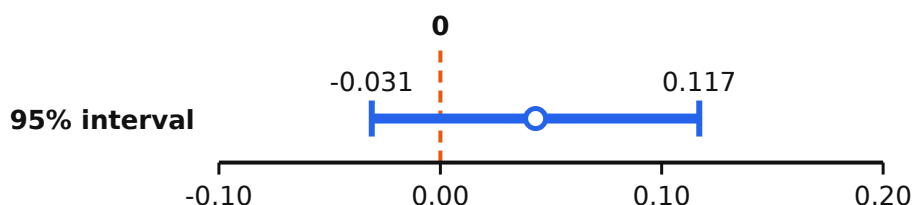
AP Statistics Proportions Worksheet: problems 16-20

Problem 16: Interval for a difference

In a random sample of 300 residents of Town A, 156 support a new park levy. In an independent random sample of 250 residents of Town B, 105 support it. Assume all conditions are met. Construct a 95% confidence interval for $p_A - p_B$.

Problem 17: Justifying a claim with an interval

A 95% confidence interval for $p_1 - p_2$, the difference in the proportions of two groups who prefer online shopping, is $(-0.031, 0.117)$. Does the interval provide convincing evidence that the proportion is higher in group 1? Justify the answer.



A 95% interval for $p_1 - p_2$.

Problem 18: Two-proportion z test

A company randomly assigns 200 users to App A and 200 users to App B. In App A, 130 users finish the sign-up; in App B, 112 do. Test whether App A has a higher completion rate than App B. Find the pooled proportion, the test statistic, and the P-value.

Problem 19: Describing a Type I error

A battery company claims that 8% of its batteries are defective. An inspector tests $H_0:p=0.08$ versus $H_a:p>0.08$. Describe a Type I error in context and state its probability if the

significance level is 0.05.

Problem 20: Describing a Type II error

For the same battery test of $H_0: p = 0.08$ versus $H_a: p > 0.08$, describe a Type II error in context and one possible consequence.

AP Statistics Proportions Worksheet: problems 21-24

Problem 21: Power and Type II error

A test has power 0.72 against the alternative $p = 0.60$. Find the probability of a Type II error for that alternative, and list two ways to increase the power without changing the alternative value.

Problem 22: Computing power

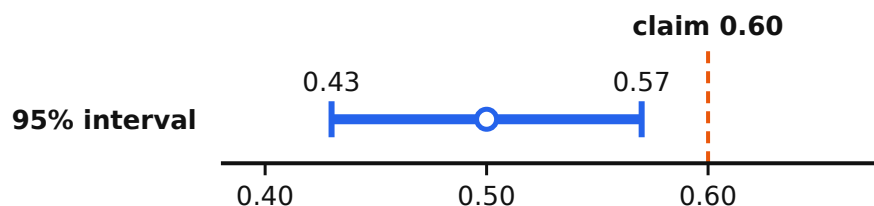
A test of $H_0: p = 0.50$ versus $H_a: p > 0.50$ uses $n = 100$ and $\alpha = 0.05$. Find the power of the test when the true proportion is $p = 0.60$. Use the critical value $z^* = 1.645$.

Problem 23: Four-step significance test

A school newspaper claims that 70% of the seniors in a large state plan to attend college. Noah thinks the true percentage is lower. In a random sample of 220 seniors from the state (far more than 2,200 seniors), 143 plan to attend college. Carry out a significance test at the 0.05 level.

Problem 24: Interval and test agree

A 95% confidence interval for a population proportion is (0.43, 0.57). Use the interval to decide what a two-sided significance test at $\alpha = 0.05$ would conclude for (a) $H_0: p = 0.60$ and (b) $H_0: p = 0.50$.



A 95% interval and the claimed value 0.60.

How to use this ap statistics proportions worksheet

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

