GENERAL

ap statistics investigative task chapter 18 answers

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Unlocking AP Statistics Investigative Task Chapter 18: A Complete Guide to Answers and Insights

When you're tackling the AP Statistics curriculum, Chapter 18—"Investigative Tasks"—is one of the most practical, data driven sections of the course. It forces you to apply everything you've learned about probability, hypothesis testing, confidence intervals, and data interpretation to real world scenarios. In this article, we'll walk through the most common investigative tasks, provide step by step solutions, highlight the reasoning behind each answer, and give you a solid framework for tackling any problem that may appear on the exam or in your coursework. Whether you're looking for the exact **AP Statistics investigative task chapter 18 answers** or simply want to deepen your understanding, this guide covers it all.

Why Chapter 18 Matters in the AP Statistics Exam

Chapter 18 is unique because it blends conceptual knowledge with practical application. The exam often includes a "Data Investigation" section where you analyze a dataset, choose an appropriate statistical method, and interpret the results. Mastering this chapter means you can:

- Identify the correct statistical tool for a given situation.
- Compute and interpret confidence intervals, p values, and effect sizes.
- Make data based recommendations and justify them with evidence.
- Communicate findings clearly, a skill the College Board explicitly rewards.

Because the AP exam's multiple choice questions frequently revolve around real world data, the **AP Statistics investigative task chapter 18 answers** you learn here translate directly into exam success.

Key Concepts Covered in Chapter 18

Before diving into solutions, let's recap the core statistical concepts you'll need. These form the backbone of every investigative task answer:

1. Sampling and Sampling Distributions

Understanding how a sample relates to a population and how the sample mean or proportion follows a normal distribution (or approximates it) is essential for constructing confidence intervals and conducting hypothesis tests.

2. Confidence Intervals

CI calculations differ for means, proportions, and differences between two groups. Remember the critical values (z* or t*) and the margin of error formula.

3. Hypothesis Testing

Null vs. alternative hypotheses, test statistics (z or t), p values, and decision rules. Pay special attention to one tailed vs. two tailed tests.

4. Effect Size and Practical Significance

Statistical significance can be misleading if the effect size is negligible. Knowing how to compute Cohen's d or

relative risk helps you interpret real impact.

5. Regression and Correlation

Linear regression models, R^2, residuals, and the assumptions underlying simple linear regression. These concepts often appear in investigative tasks that involve predicting one variable from another.

Common Investigative Task Scenarios

Below are five typical investigative task scenarios that frequently show up in Chapter 18. For each, we'll provide a concise problem statement, the full solution, and a brief explanation of why the answer is correct. These are the kinds of problems you might encounter on the AP exam or in practice assignments.

Scenario 1: Evaluating a New Drug's Effectiveness

Problem:A pharmaceutical company claims that its new drug reduces systolic blood pressure by an average of 8 mmHg compared to a placebo. In a randomized controlled trial, 30 patients receive the drug and 30 receive placebo. The drug group's mean reduction is 12 mmHg (SD = 4 mmHg) and the placebo group's mean reduction is 5 mmHg (SD = 3 mmHg). Test the company's claim at the 0.05 significance level.

Solution:

1. State the hypotheses:\\n\\nH €: ;Â j ¼ , = 0 (no difference)
2. H •: ;Â j ¼ , > 0 (drug reduces BP more than placebo)

SE = " [(s •²/n •) + (s ,²/n ,)] = " [(4²/30) + (3²/30)] "H " [(16/30) + (9/30)] "H " (0.533 + 0.3) "H " 0.833 "H 0.913.

t = (12 – 5)/SE = 7/0.913 "H 7.67.

Answer: The company's claim is supported; the drug significantly reduces systolic blood pressure compared to placebo.

Scenario 2: Confidence Interval for a Proportion

Problem:A survey of 400 students at a university found that 240 prefer online classes. Construct a 95% confidence interval for the proportion of all university students who prefer online classes.

Solution:

1. Sample proportion, p0* Ú #C óC Ú ãc à
2. Standard error, SE = " [p0"ƒ j)/n] = " [0.6·0.4/400] = " [0.24/400] = " 0.0006 "H 0.0245.
3. Critical value for 95% CI (z*) = 1.96.
4. Margin of error, ME = z*·SE = 1.96·0.0245 "H 0.0481.
5. Confidence interval: p0* ÔZ Ú ãc ã Cƒ * ƒ ãSS 'Ê ãcCƒ 'à

Answer: We are 95% confident that between 55.2% and 64.8% of all university students prefer online classes.

Scenario 3: Comparing Two Means with Unequal Variances

Problem: Two independent samples of students were tested on a math exam. Sample A (n = 25) has a mean score of 78 with SD = 10. Sample B (n = 30) has a mean score of 72 with SD = 15. Test whether the mean scores differ at the 0.01 significance level.

Solution:

1. Hypotheses:\\n\\nH €: ;Â j ¼ , = 0

2. H •: ;Â j ¼ , "` 0

SE = " [(s •²/n •) + (s ,²/n ,)] = " [(10²/25) + (15²/30)] = " [(100/25) + (225/30)] = " [4 + 7.5] = " 11.5 "H 3.391.

t = (78 – 72)/3.391 "H 6/3.391 "H 1.77.

df "H [(s •²/n • + s ,²/n ,)²] / [(s • t/(n •²(n • – 1))) + (s , t/(n ,²(n , – 1)))] "H 49 (rounded).

Answer: At the 0.01 level, there is insufficient evidence to conclude that the mean scores differ.

Scenario 4: Regression Prediction

Problem:A researcher collected data on hours studied (X) and test scores (Y) for 20 students. The regression line is Y = 45 + 5X. Predict the test score for a student who studies 8 hours. Also, interpret the slope.

Solution:

Answer: The predicted score is 85. The slope indicates a strong positive relationship between study time and test performance.

Scenario 5: Testing Proportions with a One Sample z Test

Problem:A new teaching method claims that at least 70% of students will score above 90% on a final exam. In a class of 50 students, 32 scored above 90%. Test this claim at ; Ú ã Rà

Solution:

1. Hypotheses:\\n\\nH €: p = 0.70
2. H •: p > 0.70

SE = " [p €(1 – p €)/n] = " [0.7·0.3/50] = " [0.21/50] = " 0.0042 "H 0.0648.

z = (p0* j ’õ4Z Ú ƒ ãcJ j ãs ’ó ã cCŠ $Š c ã“bà

Answer: There is not enough evidence to support the claim that at least 70% of students scored above 90%.

Step by Step Guide to Solving Investigative Tasks

While the scenarios above provide concrete answers, you’ll often need to adapt these strategies to new problems. Use the following systematic approach:

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