

Part IV: Statistical Inference

Statistical Inference accounts for 30%-40% of the material covered on the AP Exam. “*Statistical Inference guides the selection of appropriate models.*”

Check your understanding of the following topics from Chapters 10-14 of YMS2e.

IV. STATISTICAL INFERENCE: ESTIMATING POPULATION PARAMETERS AND TESTING HYPOTHESES

A. Estimation (point estimators and confidence intervals)

- 1. Estimating population parameters and margins of error
- 2. Properties of point estimators, including unbiasedness and variability
- 3. Logic of confidence intervals, meaning of confidence level and confidence intervals, and properties of confidence intervals
- 4. Large sample confidence interval for a proportion
- 5. Large sample confidence interval for a difference between two proportions
- 6. Confidence interval for a mean
- 7. Confidence interval for a difference between two means (unpaired and paired)
- 8. Confidence interval for the slope of a least-squares regression line

B. Tests of significance

- 1. Logic of significance testing, null and alternative hypotheses; p-values; one- and two-sided tests; concepts of Type I and Type II errors; concept of power
- 2. Large sample test for a proportion
- 3. Large sample test for a difference between two proportions
- 4. Test for a mean
- 5. Test for a difference between two means (unpaired and paired)
- 6. Chi-square test for goodness of fit, homogeneity of proportions, and independence (one- and two-way tables)
- 7. Test for the slope of a least-squares regression line

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AP Exam Free Response Questions Related to Statistical Inference in YMS3e

Adapted from a compilation by Jared Derksen and Duane Hinders

Chapter 10: Estimating with Confidence					
2000:2,6a	2001:5	2002:6ab	2002B:4	2003:6b	2003B:6ab
2004:6a	2004B:5b	2005:5b	2005B:4	2006B:4	

Chapter 11: Testing a Claim					
2002:5a	2003:2	2003B:3b	2004:3c,6b	2006:6a	2006B:6adef

Chapter 12: Significance Tests in Practice			
1997:5 (paired)	1998:5	1999:6ab	2001:5 (paired)
2004B:4b	2005:4	2005B:4,6a	2006B:6b

Chapter 13: Comparing Two Population Parameters				
1997:4	2000:4a	2002:5b,6c	2002B:6a	2003B:3b
2004B:4a,5c,6a	2005:6a	2006:4	2006B:2	

Chapter 14: Chi-Square Procedures						
1998:3cd	1999:2	2002B:6b	2003:5	2003B:5c	2004:5a	2006:6cde

Chapter 15: Inference for Regression			
1999:1a,6c	2001:6b	2005B:5c	2006:2c