Chapter 9 Overview & Summaries

9.1 Significance Tests: The Basics

1. What is a significance test?

2. What is the difference between a null and an alternative hypothesis? What notation is used for each?

3. Explain the differences between one-sided and two-sided hypotheses. How can you decide which one to use?

4.

P-value	**Conclude about null hypothesis**	**Do we have convincing evidence?**
Small		
Large		

5. What is meant by a significance level?

6. Explain what it means to say that data are statistically significant.

7. How small should the P-value be in order to claim that a result is statistically significant?

8. What two circumstances guide us in choosing a level of significance?
   -
   -

9.2 Tests about a Population Proportion

1. Summarize the three conditions that must be checked before carrying out significance tests:

Random	
Normal	
Independent	

2. Describe the process for signifigance tests. Explain what is required at each step.

P	
H	
A	
N	
T	
O	
M	
S	

3. What test statistic is used when testing for a population proportion?

4. If asked to carry out a signifigance test and there is no α provided, what is recommended?

5. Can you use confidence intervals to decide between two hypotheses? What is the advantage to using confidence intervals for this purpose?

6. Why don't we always use confidence intervals?

9.3 Tests about a Population Mean

1. What are the three conditions for conducting a significance test for a population mean?

Random	
Normal	
Independent	

2. What test statistic do we use when testing a population mean?

3. How do you calculate p-values using the t-distribution table?

4. What do you do if the degrees of freedom you need is not in table b?

5. In terms of rejecting the hypothesis H_0, how is a significance test related to a confidence interval on the same population?

One-sided test	
Two-sided test	

7. What is a Type I Error?

8. What is a Type II Error?

		Truth about the population: H_0 true	Truth about the population: H_a true
Decision based on sample	Reject H_0	Type I error	Correct decision
	Fail to reject H_0	Correct decision	Type II error

9. Which error is worse, Type I or Type II?

10. What is the relationship (formula) between the significance level α and the probability of Type I Error?

11. How can we reduce the probability of a Type I error?

12. What is meant by the power of a significance test?

13. What is the relationship (formula) between Power and Type II Error?