

Name _____ Date _____ Per _____

AP REVIEW PACKET #9 INSTRUCTIONS – Due Thursday in class or by Friday 5/3 7:50– 40 points

- 1) Read Topic 15: Tests of Significance Chi-Square and Slope of Least Squares Line; pp 405-438. Answer the guided reading questions.
- 2) Do Practice Exam #4, pp 527-540. (Show ALL work on a separate paper or on a photocopy of the pages if you'd prefer.)
- 3) Correct your work in red or green ink – make sure I can tell you corrected your work! Projected AP Score = _____. (see pg 585)

Optional Bonus Activity: Go to <http://learner.org/resources/series65.html>. Watch programs 19 & 20 and do the worksheet.

Guided Reading Questions for Packet #9:

- 1) A critical question is often whether or not an observed pattern or data _____ some given _____.
- 2) The chi-square formula is _____.
- 3) In many real-world problems we want to compare two or more observed samples without any _____ about an _____.
- 4) Even if there is sufficient evidence to reject the null hypothesis of independence, we cannot _____ any direct _____.
- 5) Assumptions for inference for the slope of the least squares line include the following:
 - (1) _____
 - (2) _____
 - (3) _____
 - (4) _____
- 6) If the outcome of one even, E, doesn't affect the outcome of another event F, we say the events are _____ and we have $P(E|F) = \text{_____}$, $P(F|E) = \text{_____}$, and _____ = $P(E)P(F)$.
- 7) When the distribution one variable in a _____ table is the same for _____ of another variable, we say the two variables are independent.
- 8) In inference we wish to make a conclusion about a population parameter by analyzing a sample. A crucial assumption is always that the sampled values are independent of each other.

This typically involves checking if there was _____.

Also, to minimize the effect on independence from samples being _____ we check that _____.

If inference involves the comparison of two groups, _____ must be independent of _____.

With paired data, while the observations in each pair are not independent, the _____ must be independent of _____.

With regression errors, the _____ must be independent.

Video 19 Worksheet: CONFIDENCE INTERVALS

1. What is the process of drawing reliable conclusions from data? _____
2. What is a snapshot of people's opinions at one moment in time? _____
3. What is another name for sampling error? _____
4. What is the measure of how much different samples vary from the true result? _____
5. What is another possible source of error in polls (other than sampling error)? _____
6. What assumptions must be made when calculating a confidence interval:
 - a. _____
 - b. _____
 - c. _____
7. What formula for standard deviation is used? _____
8. Complete the statement: A 95% confidence level says that the method used gives an interval that covers
the true mean _____
9. What "z" value corresponds to $p = 0.025$, what is the area under each tail? _____ If $p = 0.005$? _____
10. What is the general formula for computing the confidence interval about the sample mean? _____
11. Complete the statement about the seesaw effect of choosing confidence intervals: The higher the
confidence level, the _____ the interval, or the _____ margin of error.

12. What happens to the confidence interval as the standard deviation increases? _____
13. If the standard deviation cannot be changed, what can be done to make the margin of error smaller?

14. What is a limitation of increasing sample size? _____
15. What is the principle of reducing the number of subjects in research called? _____
16. What formula is used to determine the necessary sample size, n ? _____
17. What two parts compose a confidence interval? _____
18. What are the two most important tools used in statistical inference? _____

Video 20 Worksheet: SIGNIFICANCE TESTS

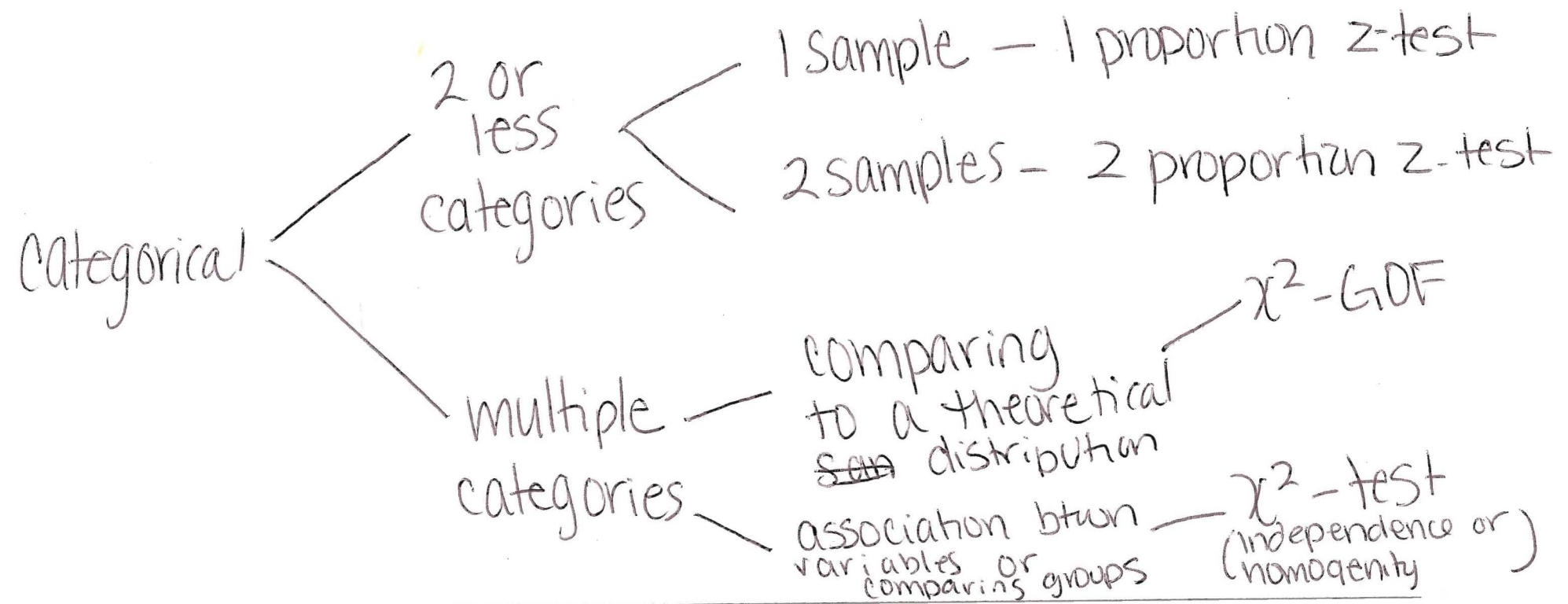
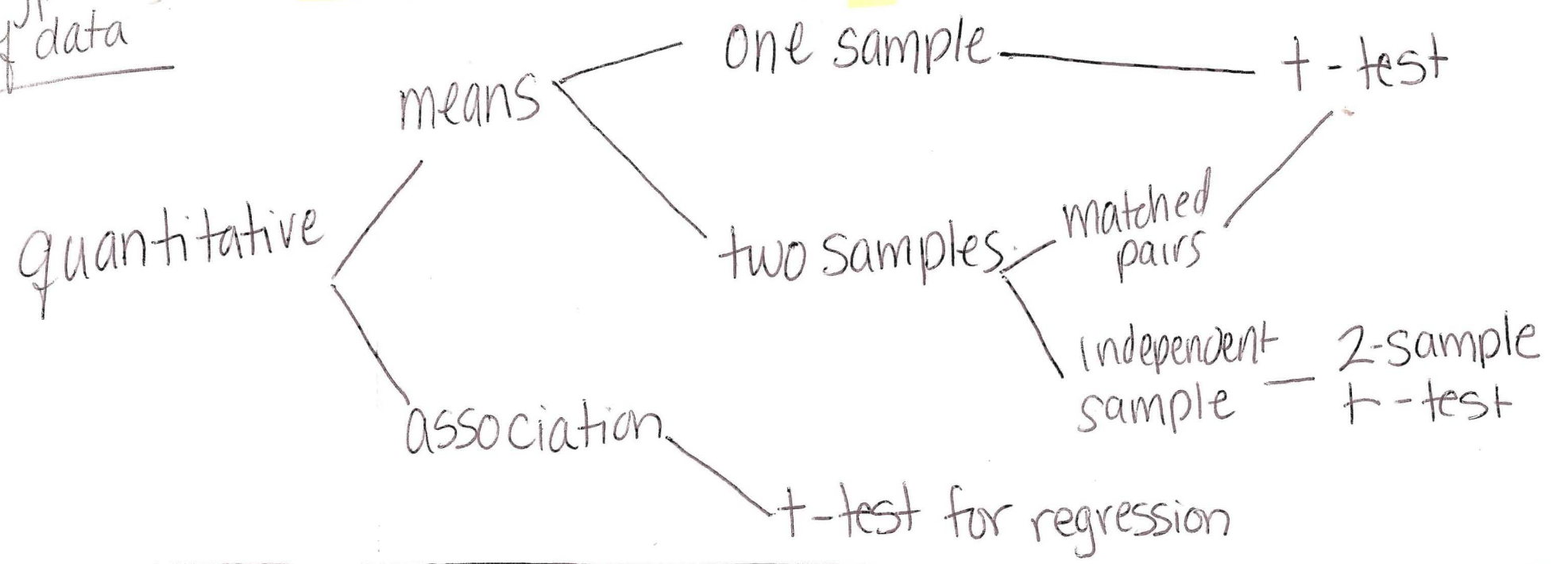
1. In a significance test, what is the assumption that nothing is going on, that there is no effect? _____
How is it written? _____
2. Which statement formally states that something is "going on"? _____
How is it written? _____
3. In the Shakespeare example, what is H_0 ? _____
Were the scholars able to reject H_0 ? Explain. _____
4. Complete: Null and alternative hypotheses are always expressed in terms of _____, not sample statistics.

5. If the population differs from its null value in a specific direction then it is a _____ alternative; if it is in either direction then it is a _____ alternative.
6. In general is it better to use a one- or two-sided test? Explain. _____

7. What is the formula for the test statistic z ? _____
8. What is the probability, computed assuming that H_0 is true, that the test statistic would take a value at least as extreme as that actually observed? _____
9. Complete the rules for p-values:
_____ p-values give evidence against H_0 . _____ p-values fail to reject H_0
10. What is the most commonly used fixed p-value? _____. This means that a result would be expected to occur 5% of the time if the null hypothesis is _____.
11. What legal case is used to illustrate an application of a test of significance? _____
12. True or False. Lack of significance does not imply that H_0 is true, especially when the test is based on only a few observations. _____
13. A result can be statistically significant and yet still unimportant. What is one factor that illustrates this statement? _____
14. What are the two most common types of statistical inference? _____

choosing a test / confidence interval

type of data



	what was decided	reality
Type I	reject H_0	H_0 true $\rightarrow H_A$ false
Type II	fail to reject H_0	H_0 false $\rightarrow H_A$ true
Power	reject H_0	H_0 false

H_0 in this case:

H_0 : Antipollution is not effective

Type I - reject ~~anti~~ H_0 and conclude that the device is effective. H_A

But, H_0 is really true so Antipollution device is not effective!