Name _____ Date _____ Per_____ #_____

AP REVIEW PACKET #7 INSTRUCTIONS – Due Thursday in class or by Friday 4/26 7:50– 40 points

1) Everyone: Read Topic 11: The Normal Distribution; pp 262-287 and Topic 12: Sampling Distributions; pp 289-317. While you read, answer the questions below.

Non-seniors: download the CST packet from the webpage, do all problems and show work. Attach your to this packet. 2 & 3 below not required.

Seniors: do 2 and 3 below

2) Answer the multiple choice questions in this packet, these will be graded for accuracy. Show all work and then copy your answers into the blanks below.

41. _____ 42. _____ 43. _____ 44. _____ 45. _____

3) Do practice exam 2 in the Barron's book, pp 469-482. Show your work on a photocopy or on a separate paper. Correct your work, pg 486, in red or green ink! Calculate your projected AP Score (see pg 585).

AP Score = _____

Optional Bonus Activity: Go to http://learner.org/resources/series65.html. Watch programs 12 & 13 do the worksheet.

Guided Reading Questions for Packet #7:

1) The normal distribution is valuable in _____ various natural phenomena, especially those involving

_____ or _____.

2) The distance from the mean to the points of inflection is precisely _____.

3) Our interest is not so much in relative heights under the normal curve as it is in _____ area.

4) Tables of normal distribution show the area to the _____ of a given point. How do you calculate the area in the other direction?

5) How can tables be used to calculate the area between two points?

6) Don't use the normal model if the distribution isn't _____ and _____.

7) When is it not appropriate to use the normal model to approximate the binomial model?

8) How can a normal probability plot be used to determine if data is approximately normal?

9) _____ and _____ are examples of population parameters and _____ and

_____ are examples of statistics.

10) The sampling distribution of $\hat{p}$ is approximately normal with mean _____ and standard deviation _____.

11) Why should the sample be no larger than 10% of the population?

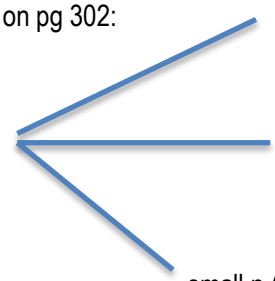
12) Define the Central Limit Theorem:

13) The sampling distribution of $\bar{x}$ is approximately normal with mean _____ and standard deviation _____.

14) Like the binomial distribution, the t-distribution is different for different values of _____.

15) Copy the tree diagram on pg 302:

Use the t-distribution with an SRS of size n and



large n (>=40) :

medium n (15-40) :

small n (<=15) :

16) Copy the 3 summary bullet points

Packet Multiple Choice Questions:

41. A study was conducted of the relationship between the number of *hours* of television a student watched in the 24-hour period before a statistics examination and the *score* on the exam. The following is a computer printout from a least-squares regression analysis.

Predictor	Coeff	StDev	T	P
Constant	93.052	3.426	27.16	0.000
Hours	-3.2319 0.7819	-4.13	0.001	
s =7.843	R-Sq = 55.0%	R-Sq(adj) =51.7%		

Which of the following gives the correct value and interpretation of the correlation coefficient for the linear relationship between the test score and the number of hours of television watched?

(A) Correlation =-0.742. The linear relationship between the test score and the number of hours of TV watched is moderate and negative.

(B) Correlation =0.550. Fifty-five percent of the variation in test scores is explained by the number of hours of TV watched.

(C) Correlation =7.416. There is a relatively weak linear relationship between the test score and the number of hours of TV watched.

(D) Correlation =0.742. About 74% of the data points lie on the least squares regression line.

(E) Correlation =-0.742. For every additional hour of television watched, the average test score dropped by about three-fourths of a point.

42. Allison and her twin sister Brenda both take Advanced Placement European History. Allison is in the morning class while Brenda is in the afternoon class. On the final exam, Allison received a score of 89 where the scores had a mean of 87 and a standard deviation of 3. Brenda received a score of 90 on the same test except that her class scores had a mean of 89 with a standard deviation of 5. Which statement is true concerning the scores of the sisters relative to the scores on their own classes?

(A) Brenda had a higher score on the test and therefore performed better relative to her own classmate's scores.

(B) Allison performed better relative to her own classmate's scores.

(C) Allison and Brenda performed equally as well relative to their own classmate's scores.

(D) We cannot compare their scores since they are in different classes.

(E) We do not know how many students are in each class, so any comparison may not be fair.

43. The maker of printer cartridges for laser printers wants to estimate the mean number of documents J1 that can be printed on a new high-speed printer.The company decides to test the cartridge on two dozen different laser printers. Each document is identical in number of words and amount of graphics. A histogram of the number of pages printed for each printer shows no outliers and is fairly bell-shaped. The mean and standard deviation of the sample were 3,875 sheets, and 170 sheets, respectively. It can be assumed that the laser printers were a random sample of all laser printers on the market. Which of the following is the correct formula for a 90% confidence interval for the mean number of pages printed with the new type of cartridge?

(A) $3{,}875 \pm 1.711 \times \frac{170}{\sqrt{24}}$

(B) $3{,}875 \pm 1.714 \times \frac{170}{\sqrt{24}}$

(C) $3{,}875 \pm 1.711 \times \frac{170}{\sqrt{23}}$

(D) $3{,}875 \pm 1.714 \times \frac{170}{\sqrt{23}}$

(E) The company should only compute a 95% confidence interval for these data.

44. The manager at an employment agency is interested in knowing if there is a significant difference in the mean ages of executives at two rival computer software companies. This information will help him to best place people in positions at these companies. He was allowed access to the ages of all of the executives. He found a 95% t-confidence interval for the difference in the mean ages of all the executives at both companies. There are 86 executives at one company and 79 at the other. Why is the information provided by this interval NOT useful for this situation?

(A) There is too much variation in the length of time the workers have been at their jobs.

(B) There is too much variation in the ages of the executives at both companies.

(C) Both populations of executive ages were used, so a confidence interval to estimate the difference in mean ages is not necessary.

(D) The sample sizes are not the same.

(E) The shapes of the distribution of ages are probably not normal.

45. The owner of a camera shop deals with on average 40 customers per day. Typically, 15% of these customers require repairs to camera equipment. If X is the number of customers the owner sees on a given day until one needs repairs, which of the following best describes the probability distribution of X?

(A) Binomial (B) Chi-square (C) Geometric (D) Normal (E) *t*

Bonus Videos : Video 12 Worksheet - EXPERIMENTAL DESIGN

1. What kind of evidence is based on a few individual cases? _____
2. What is the name of an object that is being studied in an experiment? _____
3. What is the procedure imposed on a subject called? _____
4. What example of an experiment was shown in the video? _____
5. What are the explanatory variables in a treatment called? _____
6. What is an inert, harmless substance used in an experiment called? _____
7. If neither the subject nor experimenter know who is receiving the treatment, what is this process called?
8. What is the group called that does not receive treatment? _____
9. Describe the placebo effect.
10. When you divide a sample into two groups, what must you do to avoid bias?
11. Give an example of bias as a result of poorly chosen experimental groups.
12. How can bias be avoided in assigning subjects to groups?

13. When you assign subjects numerical labels, what must be true of the numerical labels?

14. When reading a random number table, what do you do when you come to a space (gap)?

15. What example was used in the video to illustrate the use of a random number assignment?

16. In the fictional situation of a poor experimental design, what 5 problems were illustrated?

    1.

    2.

    3.

    4.

    5.

17. What makes a good experiment?

    _____, _____

    _____, _____

Video 13 Worksheet - BLOCKING AND SAMPLING

1. What kind of experiment divides the subjects into groups that share a characteristic? _____
2. Why is the technique of blocking used? _____
3. What example in the video illustrates blocking? _____
4. What is a count of every item in a population? _____
5. Who conducted the first U. S. Census? _____
6. Where did the undercounts occur in early census-taking? _____
7. What two major losses do groups experience as a result of undercounts in a census?

   _____, _____
8. Why was the U. S. Census established? _____
9. What is a count or measure of a representative portion of the whole? _____
10. What is the whole group being studied called? _____
11. What is a systematic distortion of outcomes? _____
12. What example of sampling is illustrated in the video? _____
13. What is a time series chart of sample data? _____