AP STATISTICS **Name**:_____ **Per**: ____
Extra Review Chapters 23 – 25

MULTIPLE CHOICE Decide which is the best choice and fill in the corresponding blank with the letter chosen.

_____ 1. Find the t* (t critical value) for 95% confidence with df = 7.

A) 2.447
B) 2.365
C) 1.96
D) 2.306
E) 1.895

_____ 2. It is appropriate to use a t-distribution instead of a normal distribution when

A) The sample mean is used as an estimate for the population mean
B) The sample proportion is used as an estimate for the population proportion
C) The sample standard deviation is used as an estimate for the population standard deviation.
D) When the sample standard deviation is unknown.

_____ 3 A 90% CI for the mean weight of a Krispy Kreme donut is (27.3, 29.5). What is the margin of error?

A) 28.4
B) 2.2
C) 4.4
D) 1.1
E) 0.5

_____ 4. 90% CI: (27.3, 29.5)
Consider the following statement:
"If we take many random samples of Krispy Kreme donuts, 90% of the time, the mean weight of the sample will be between 27.3 and 29.5 grams."

A) True
B) False

_____ 5. 90% CI: (27.3, 29.5)
Consider the following statement:
"If we take many random samples of Krispy Kreme donuts, 90% of them would produce this confidence interval."

A) True
B) False

_____ 6. 90% CI: (27.3, 29.5)
Consider the following statement:
"If we take many random samples of Krispy Kreme donuts, about 90% of the resulting confidence intervals would contain the true mean weight of a Krispy Kreme glazed donut."

A) True
B) False

_____ 7. 90% CI: (27.3, 29.5)
The center of the aforementioned interval is 28.4 grams. This number is a...

C) test statistic
D) sample statistic
E) random sample
F) population parameter
G) measure of spread

_____ 8. Another name for the center of a confidence interval (the sample statistic) is...

A) point estimate
B) alpha
C) measure of central tendency
D) median
E) simple random sample

_____ 9. Which of the following results in a **narrower** confidence interval?

A) decreasing sample size
B) increasing confidence level
C) lowering alpha
D) lowering confidence level
E) all of the above

_____ 10. Which of the following statements about Student's t-distributions is FALSE?

A) They are unimodal and roughly symmetric
B) They have more variance than the Normal model
C) As df increases, so does the area in the tails
D) *[none of these]*

11. **Practice explaining p-values** Krunchy Kreme claims that their glazed donuts have a mean weight of 29 grams. You and your friends grab two dozen donuts on your way home from school, and weigh them, finding a mean weight of 27.9 grams. You test the following hypotheses:

Ho: $\mu = 29$ ("μ" is the true mean weight of a KK glazed donut)
Ha: $\mu < 29$

and get a p-value of 0.047. **Carefully explain this p-value in context.**

12. **Errors in hypothesis testing** Based on a 5% significance level, you reject the Ho and accuse Krunchy Kreme donuts of false advertising. What type of error – Type I or Type II – are you in danger of committing if you are wrong?

13. **Practice explaining p-values** Based on a sample of 50 students each from two very large high schools (school "A" and school "B"), the difference in mean SAT scores was found to be 210 points.

School administrators test the following hypotheses:
Ho: $\mu_A = \mu_B$ ("μ" is the true mean SAT score for each school)
Ha: $\mu_A \neq \mu_B$
and get a p-value of 0.0013. **Carefully explain this p-value in context.**

Answers!

1. B
2. C
3. D (take half the width of the interval!)
4. False
5. False
6. True
7. B
8. A
9. D
10. C
11. If the mean weight of a KK glazed donut really is 29 ounces, then the probability that natural sampling variation produces a sample with this LOW of a mean weight (27.9 grams) is 0.047
12. Type I Error (incorrectly rejecting the H0)
13. If there really is no difference between the two schools' mean SAT scores, then the probability that natural sampling variation produces a difference this large (or larger) is about 13 out of 10000 (0.0013)