

Feedback — Quiz 4

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You submitted this quiz on **Thu 28 Aug 2014 7:51 AM PDT**. You got a score of **11.00** out of **11.00**.

Question 1

A pharmaceutical company is interested in testing a potential blood pressure lowering medication. Their first examination considers only subjects that received the medication at baseline then two weeks later. The data are as follows (SBP in mmHg)

Subject Baseline Week 2

1	140	132
2	138	135
3	150	151
4	148	146
5	135	130

Consider testing the hypothesis that there was a mean reduction in blood pressure? Give the P-value for the associated two sided test.

Your Answer	Score	Explanation
<input type="radio"/> 0.043		
<input type="radio"/> 0.10		
<input type="radio"/> 0.05		
<input checked="" type="radio"/> 0.087	✓ 1.00	
Total	1.00 / 1.00	

Question 2

A sample of 9 men yielded a sample average brain volume of 1,100cc and a standard deviation of 30cc. What is the complete set of values of μ_0 that a test of $H_0 : \mu = \mu_0$ would fail to reject the null hypothesis in a two sided 5% Students t-test?

Your Answer	Score	Explanation
<input type="radio"/> 1081 to 1119		
<input type="radio"/> 1031 to 1169		
<input type="radio"/> 1080 to 1120		
<input checked="" type="radio"/> 1077 to 1123	✓ 1.00	
Total	1.00 / 1.00	

Question 3

Researchers conducted a blind taste test of Coke versus Pepsi. Each of four people was asked which of two blinded drinks given in random order that they preferred. The data was such that 3 of the 4 people chose Coke. Assuming that this sample is representative, report a P-value for a test of the hypothesis that Coke is preferred to Pepsi using a one sided exact test.

Your Answer	Score	Explanation
<input checked="" type="radio"/> 0.31	✓ 1.00	
<input type="radio"/> 0.10		
<input type="radio"/> 0.62		
<input type="radio"/> 0.005		
Total	1.00 / 1.00	

Question 4

Infection rates at a hospital above 1 infection per 100 person days at risk are believed to be too high and are used as a benchmark. A hospital that had previously been above the benchmark recently had 10 infections over the last 1,787 person days at risk. About what is the one sided P-value for the relevant test of whether the hospital is *below* the standard?

Your Answer	Score	Explanation
<input type="radio"/> 0.11		
<input checked="" type="radio"/> 0.03	1.00	✓
<input type="radio"/> 0.22		
<input type="radio"/> 0.52		
Total	1.00 / 1.00	

Question 5

Suppose that 18 obese subjects were randomized, 9 each, to a new diet pill and a placebo. Subjects' body mass indices (BMIs) were measured at a baseline and again after having received the treatment or placebo for four weeks. The average difference from follow-up to the baseline (followup - baseline) was -3 kg/m^2 for the treated group and 1 kg/m^2 for the placebo group. The corresponding standard deviations of the differences was 1.5 kg/m^2 for the treatment group and 1.8 kg/m^2 for the placebo group. Does the change in BMI over the two year period appear to differ between the treated and placebo groups? Assuming normality of the underlying data and a common population variance, give a pvalue for a two sided t test.

Your Answer	Score	Explanation
<input type="radio"/> Less than 0.05, but larger than 0.01		
<input type="radio"/> Larger than 0.10		

☒ Less than 0.01 ✓ 1.00

☐ Less than 0.10 but larger than 0.05

Total 1.00 / 1.00

Question 6

Brain volumes for 9 men yielded a 90% confidence interval of 1,077 cc to 1,123 cc. Would you reject in a two sided 5% hypothesis test of $H_0 : \mu = 1,078$?

Your Answer	Score	Explanation
<input type="radio"/> Yes you would reject.		
<input type="radio"/> Where does Brian come up with these questions?		
<input type="radio"/> It's impossible to tell.		
<input checked="" type="radio"/> No you wouldn't reject.	✓ 1.00	
Total	1.00 / 1.00	

Question 7

Researchers would like to conduct a study of 100 healthy adults to detect a four year mean brain volume loss of $.01 \text{ mm}^3$. Assume that the standard deviation of four year volume loss in this population is $.04 \text{ mm}^3$. About what would be the power of the study for a 5% one sided test versus a null hypothesis of no volume loss?

Your Answer	Score	Explanation
<input type="radio"/> 0.60		
<input type="radio"/> 0.50		
<input type="radio"/> 0.70		

<input checked="" type="radio"/> 0.80	✓	1.00
Total		1.00 / 1.00

Question 8

Researchers would like to conduct a study of n healthy adults to detect a four year mean brain volume loss of $.01 \text{ mm}^3$. Assume that the standard deviation of four year volume loss in this population is $.04 \text{ mm}^3$. About what would be the value of n needed for 90% power of type one error rate of 5% one sided test versus a null hypothesis of no volume loss?

Your Answer	Score	Explanation
<input type="radio"/> 160		
<input checked="" type="radio"/> 140	✓ 1.00	
<input type="radio"/> 120		
<input type="radio"/> 180		
Total	1.00 / 1.00	

Question 9

As you increase the type one error rate, α , what happens to power?

Your Answer	Score	Explanation
<input type="radio"/> No, for real, where does Brian come up with these problems?		
<input type="radio"/> It's impossible to tell given the information in the problem.		
<input checked="" type="radio"/> You will get larger power.	✓ 1.00	
<input type="radio"/> You will get smaller power.		

Total	1.00 /
	1.00

Question 10

The Daily Planet ran a recent story about Kryptonite poisoning in the water supply after a recent event in Metropolis. Their usual field reporter, Clark Kent, called in sick and so Lois Lane reported the story. Researchers sampled 288 individuals and found mean blood Kryptonite levels of 44, both measured in Lex Luthors per milliliter (LL/ml). They compared this to 288 sampled individuals from Gotham city who had an average level of 42.04. About what is the Pvalue for a two sided Z test of the relevant hypothesis? Assume that the standard deviation is 12 for both groups.

Your Answer	Score	Explanation
<input type="radio"/> 0.01		
<input type="radio"/> 0.10		
<input type="radio"/> 0.20		
<input checked="" type="radio"/> 0.05	✓ 1.00	
Total	1.00 / 1.00	

Question 11

Suppose that a researcher performs 10 hypothesis tests and wants a familywise error rate of no more than 5%. What alpha level should she compare her pvalues to in order to ensure the desired error rate? Express it as a proportion to two decimal places.

Your Answer	Score	Explanation
<input type="radio"/> 0.0005		

☒ 0.005

✓

1.00

☐ 0.1

☐ 0.05

Total

1.00 / 1.00