

## Feedback — Quiz 4 **\*\*Please Note: No Grace Period\*\***

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Thank you. Your submission for this quiz was received.

You submitted this quiz on **Sat 13 Jun 2015 4:42 PM SGT**. You got a score of **9.00** out of **9.00**.

### 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 T test.

(Hint, consider that the observations are paired.)

Your Answer	Score	Explanation
<input type="radio"/> 0.05		
<input type="radio"/> 0.043		
<input checked="" type="radio"/> 0.087	✓ 1.00	
<input type="radio"/> 0.10		
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  $\mu_0$  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 checked="" type="radio"/> 1077 to 1123	✓ 1.00	
<input type="radio"/> 1081 to 1119		
<input type="radio"/> 1031 to 1169		
<input type="radio"/> 1080 to 1120		
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 type="radio"/> 0.10		
<input type="radio"/> 0.62		
<input checked="" type="radio"/> 0.31	✓ 1.00	
<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"/> 0.52		
<input type="radio"/> 0.22		
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  $-3 \text{ kg/m}^2$  for the treated group and  $1 \text{ kg/m}^2$  for the placebo group. The corresponding standard deviations of the differences was  $1.5 \text{ kg/m}^2$  for the treatment group and  $1.8 \text{ kg/m}^2$  for the placebo group. Does the change in BMI 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"/> Larger than 0.10		
<input checked="" type="radio"/> Less than 0.01	✓ 1.00	
<input type="radio"/> Less than 0.10 but larger than 0.05		
<input type="radio"/> Less than 0.05, but larger than 0.01		
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"/> Where does Brian come up with these questions?		
<input checked="" type="radio"/> No you wouldn't reject.	✓ 1.00	
<input type="radio"/> Yes you would reject.		
<input type="radio"/> It's impossible to tell.		
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"/> 0.70		
<input type="radio"/> 0.60		
<input type="radio"/> 0.50		
<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"/> 180		
<input type="radio"/> 160		
<input checked="" type="radio"/> 140	✓ 1.00	
<input type="radio"/> 120		
Total	1.00 / 1.00	

## Question 9

As you increase the type one error rate,  $\alpha$ , what happens to power?

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