

## Feedback — Quiz 4 **\*\*Please Note: No Grace Period\*\*** [Help](#)

You submitted this quiz on **Wed 7 Jan 2015 7:30 PM PST**. You got a score of **8.00** out of **9.00**. You can [attempt again](#), if you'd like.

### 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

Your Answer	Score	Explanation
<input checked="" type="radio"/> 0.087	✓ 1.00	
<input type="radio"/> 0.05		
<input type="radio"/> 0.10		
<input type="radio"/> 0.043		
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 type="radio"/> 1077 to 1123		
<input type="radio"/> 1031 to 1169		
<input checked="" type="radio"/> 1080 to 1120	 0.00	
<input type="radio"/> 1081 to 1119		
Total	0.00 / 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"/> 0.62		
<input type="radio"/> 0.10		
<input type="radio"/> 0.005		
<input checked="" type="radio"/> 0.31	 1.00	
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"/> 0.22		
<input type="radio"/> 0.52		
<input type="radio"/> 0.11		
<input checked="" type="radio"/> 0.03	✓ 1.00	
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 checked="" type="radio"/> Less than 0.01	✓ 1.00	
<input type="radio"/> Larger than 0.10		

☐ Less than 0.10 but larger than 0.05

☐ 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**

☐ It's impossible to tell.

☒ No you wouldn't reject.



1.00

☐ Where does Brian come up with these questions?

☐ Yes you would reject.

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**

☐ 0.70

☐ 0.60

☐ 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"/> 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,  $\alpha$ , what happens to power?

Your Answer	Score	Explanation
<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?		
<input checked="" type="radio"/> You will get larger power.	✓	1.00
<input type="radio"/> You will get smaller power.		

Total

1.00 /  
1.00