

## 12.E: Distribution Free Tests (Exercises)

### General Questions

#### Q1

For the following data, how many ways could the data be arranged (including the original arrangement) so that the advantage of the Experimental Group mean over the Control Group mean is as large or larger than the original arrangement?

Experimental	Control
5	1
10	2
15	3
16	4
17	9

#### Q2

For the data in Problem 1, how many ways can the data be rearranged?

#### Q3

What is the one-tailed probability for a test of the difference?

#### Q4

For the following data, how many ways can the data be rearranged?

T1	T2	Control
7	14	0
8	19	2
11	21	5

#### Q5

In general, are rank randomization tests or randomization tests more powerful?

#### Q6

What is the advantage of rank randomization tests over randomization tests?

#### Q7

Test whether the differences among conditions for the data in Problem 1 is significant (one tailed) at the 0.01 level using a rank randomization test.

### Questions from Case Studies

The following question uses data from the SAT and GPA case study.

#### Q8

Compute Spearman's  $\rho$  for the relationship between UGPA and SAT.

The following question uses data from the Stereograms case study.

#### Q9

Test the difference in central tendency between the two conditions using a rank-randomization test (with the normal approximation) with a one-tailed test. Give the  $Z$  and the  $p$ .

The following question uses data from the Smiles and Leniency case study.

#### Q10

Test the difference in central tendency between the four conditions using a rank-randomization test (with the normal approximation). Give the Chi Square and the  $p$ .

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