Name:

Quiz 17, Attempt 1

Five students take an IQ test. Three subjects were on placebo and two were on NZT when taking the test. Their scores are reported below. Use a permutation test (test statistic = difference in means) in order to determine if NZT improves IQ. Specifically, test the null hypothesis that the distributions are identical against a two-sided alternative.

NZT	102 ④	96 ③	
Placebo	120 ⑤	90 ②	84 ①

120	102	96	90	84	t
✗	✗				21
✗		✗			16
✗			✗		11
✗				✗	6
	✗	✗			1
	✗		✗		-4
	✗			✗	-9
		✗	✗		-9
		✗		✗	-14
			✗	✗	-19

$$p\text{-value} = 2 \cdot \frac{5}{10} = 1$$

Repeat this problem using the rank-sum test.

1	2	3	4	5	
+	+				3
+		+			4
+			+		5
+				+	6
+				+	5
	✗	✗			6
	✗		✗		7
	✗			✗	7
		✗	✗		7
		✗		✗	8
			✗	✗	9

$$p\text{-value} = \frac{4}{5}$$

Quiz 15, Attempt 2

The sign test is less sensitive to outliers than the signed-rank test.

~~Non-parametric tests tend to be less powerful and more sensitive to outliers than their parametric counterparts.~~

~~Non-parametric tests require the population distribution to be from a specific family in order to be valid.~~