

**Instructions:** Answer each question as thoroughly as possible. Round answers to 4 decimal places as needed. Exact answers are best when possible. Be sure to answer all parts of each question.

1. Do people work longer with breakfast than without? Use the data in the table and conduct a Wilcoxon test of the paired data to see if the means are different.

Work hours with breakfast	Work hours without breakfast
8	6
7	5
9	5
5	4
9	7
8	7
10	7
7	5
6	6
9	5

$$H_0: \delta = 0$$

$$H_a: \delta \neq 0$$

Wilcoxon test ( $x, y$ , paired = TRUE)

$$p\text{-value} : 0.008433 < 0.05$$

reject  $H_0$

there is good reason to think worked hours are different w/o w/o breakfast.

2. A golf instructor is interested in determining if her new technique for improving players' golf scores is effective. She takes four (4) new students. She records their 18-hole scores before learning the technique and then after having taken her class. She conducts a hypothesis test.

	Player 1	Player 2	Player 3	Player 4
Mean score before class	83	78	93	87
Mean score after class	80	80	86	86

What tests are available to conduct on this data? What considerations should be taken into account to determine which test to conduct?

paired t-test is one option

or a Wilcoxon test is another

consider: sample size, normality of differences

answers may vary a little