PSYC 203
Assignment 13

Instructions – All answers should be submitted electronically via Google Classroom.

1. The following data are from an independent-measures experiment comparing two
   treatment conditions.

Treatment 1	Treatment 2
4	19
5	11
12	18
10	10
10	12
7	14

   a. Do these data indicate a significant difference between the treatments at the .05 level of
      significance?
   b. Compute r^2 to measure the size of the treatment effect.
   c. Write a sentence demonstrating how the outcome of the hypothesis test and the measure
      of effect size would appear in a research report.

2. A researcher is testing the effect of a new cold and flu medication on mental alertness. A
   sample of $n = 9$ college students is obtained and each student is given the normal dose of
   the medicine. Thirty minutes later, each student's performance is measured on a video
   game that requires careful attention and quick decision making. The scores for the nine
   students are as follows: 6, 8, 10, 6, 7, 13, 5, 5, 3.

   a. Assuming that scores for students in the regular population average $\mu = 10$, are the
      data sufficient to conclude that the medication has a significant effect on mental
      performance? Test at the .05 level of significance.
   b. Compute r^2, the percentage of variance explained by the treatment effect.
   c. Write a sentence demonstrating how the outcome of the hypothesis test and the measure
      of effect size would be presented in a research report.

3. A teacher gives a third grade class of $n = 16$ a reading skills test at the beginning of the
   school year. To evaluate the changes that occur during the year, students are tested again
   at the end of the year. Their test scores revealed an average improvement of $M_D = 4.7$
   points.

   a. If the variance for the difference scores is $s^2 = 144$, are the results sufficient to conclude
      that there is significant improvement? Use a one-tailed test with $\alpha = .05$.
   b. If the variance for the difference scores is reduced to $s^2 = 64$, are the results sufficient
      to conclude that there is significant improvement? Use a one-tailed test with $\alpha = .05$.
   c. Describe the effect on reducing the variance of the difference scores.