R-Assignment-6

In the following assignment, do the following for each problem:
(i) **Set up the null hypothesis and the alternative hypothesis.**
(ii) **Use R to test the hypothesis. Include the R-code.**
(iii) **Give your conclusion.**
Read pages 59-71 in "Using R for Introductory Statistics" by John Verzani and look at my lecture notes.)

1. The national Assessment of Educational Progress (NAEP) is a congressionally authorized project of the National Center for Education statistics (NCES) within the Institute of Education Science of the U.S. department of Education. NAEP has since 1969 measured achievement periodically in several subjects including mathematics. The NAEP assessment in mathematics measured the student's knowledge of mathematics and their problem solving skill across five mathematics content areas: number properties and operations, measurement, geometry, data analysis, statistics, and probability, and algebra.
"The Trial Urban District Assessment (TUDA) is designed to explore the feasibility of using National Assessment of Educational Progress (NAEP) to report on the performance of public school students at the district level." In 2011, between 1,000 and 2,700 fourth- and eighth-grade public school students from 21 urban districts participated in the NAEP TUDA in mathematics.
The math test-score is on a scale from 0 to 500. A "basic" math level is a score of 262, a "proficient" level is a score of 299 and a "advanced" level is a score of 333.

In 2007, 369 out of a sample of 900 eighth-graders in Atlanta scored at or above the Basic level in mathematics. In large public city, 57% scored at or above the Basic level in mathematics in 2007.
Source: TUDA results for 2007 from the National Center for Education Statistics, at
http://nces.ed.gov/nationsreportcard/pdf/dst2007/2008452.pdf and
Source: http://nationsreportcard.gov/tuda.asp

(A) Is the proportion of eighth-graders who scored at or above the Basic level in Atlanta significantly smaller than 0.57 at the 5% level?

In 2011, 702 out of a sample of 1300 eighth-graders in Atlanta scored at or above the Basic level in mathematics. (In large public city, the numbers was 63% in 2011).
Source: TUDA results for 2011 from the National Center for Education Statistics, at
http://nces.ed.gov/nationsreportcard/pdf/dst2011/2012452.pdf

(B) Is there a significant difference from 2007 and 2011 in the proportions of eighth-graders who scored at or above the Basic level in Atlanta at the
(i) 5% significance level?
(ii) 1% significance level?

In 2011, the mean math scale score for a random sample of 1500 eighth-graders in Charlotte was 285 with a standard deviation of 31.0. (The study reports the standard error.)
Source: TUDA results for 2011 from the National Center for Education Statistics, at
http://nces.ed.gov/nationsreportcard/pdf/dst2011/2012452.pdf

and http://nces.ed.gov/nationsreportcard/naepdata/

(C) Is there good evidence that the mean for all Charlotte eighth-graders is larger than the basic level? Use a 5% signifiance level. We don't have the individual scores but we can use the t-test, why? (Since we don't have the individual score, we cannot use the build in command in R to calculate the test-statistics, so do this problem by hand.) Use R to find $t_\alpha(n-1)$.