Ryerson University
F16 QMS 202
Practice Questions for Lecture 5
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Use the following scenario for problems ??-??

A professor in the math department of a faculty claims that there is much more variability in the final exam scores of students taking the introductory calculus course who are not majoring in sciences than for students taking the course who are majoring in sciences. Random samples of 13 non-science majors and 10 science majors are taken from the professor's class roster in his large lecture, and the following results are computed based on the final exam scores. Is there evidence to support professor's claim?

Non-Science Major	Science Major
$n = 13$	$n = 10$
$S^2 = 210.2$	$S^2 = 36.5$

1. If the index NS denotes the non-science majors and the index S denotes the science majors the null hypothesis for testing is?

   a) $\sigma_S^2 \neq \sigma_{NS}^2$
   b) $\sigma_S^2 < \sigma_{NS}^2$
   c) $\sigma_S^2 > \sigma_{NS}^2$
   d) $\sigma_S^2 > \sigma_{NS}^2$
   (e) None of the above

2. What is the value of the test statistic?

   a) 10.75
   b) 12.56
   (c) 5.76
   d) 8.76
   e) None of the above

3. What is the critical value for the test at the $\alpha = 0.05$ level of significance?

   a) 2.4837

   b) 1.9775

   c) 2.9786

   d) 1.1224

   e) None of the above

4. Which of the following represents the correct conclusion at $\alpha = 0.05$?

   a) There is no evidence of a difference in the population variances between science majors and non-science majors.

   b) There is enough evidence to conclude that the variance in final exam scores of non-science majors is greater than the variance in final exam scores of science majors.

   c) The population variances between science majors and non-science majors are the same.

   d) There is enough evidence to conclude that the variance in final exam scores of non-science majors is smaller than the variance in final exam scores of science majors.

   e) None of the above

Use the following scenario for problems ??-??

The data below presents the summary statistics for the starting annual salaries (in thousands of dollars) for individuals entering the public accounting and financial planning professions. Test whether the mean starting annual salaries for individuals entering the public accounting professions is higher than that of financial planning, assuming that the two population variances are the same.

Sample 1 (Public Accounting)	Sample 2 (Financial Planning)
$n_1 = 12$	$n_2 = 14$
$S_1 = 3.25$	$S_2 = 2.48$
$\overline{X}_1 = 60.35$	$\overline{X}_2 = 58.20$

5. Which of the following represents the relevant alternative hypothesis?

   a) $H_1 : \mu_1 - \mu_2 < 0$

   (b) $H_1 : \mu_1 - \mu_2 > 0$

   c) $H_1 : \mu_1 - \mu_2 \neq 0$

   d) $H_1 : \mu_1 - \mu_2 = 0$

   e) None of the above

6. Which of the following represents the result of the relevant hypothesis test at $\alpha = 0.05$ level of significance?

   a) The alternative hypothesis is rejected.

   (b) The null hypothesis is rejected.

   c) The null hypothesis is not rejected.

   d) Insufficient information exists on which to make a decision.

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