# Solutions to Quiz 7 (version A only)

1. Two independent samples of sizes 15 and 17 are randomly selected from two normal populations with equal however unknown variances. Which of the following distributions should be used for developing confidence intervals and for testing hypotheses about the difference between the two population means $(\mu_1 - \mu_2)$?

   A. The standard normal distribution
   B. The *t* distribution with 32 degrees of freedom
   C. The *t* distribution with 31 degrees of freedom
   D. The *t* distribution with 30 degrees of freedom
   E. Any continuous distribution since the sum of the two sample sizes exceeds 30

   **ANSWER:** D

2. Let $X_1, \ldots, X_{20}$ be a random sample from a normal distribution with variance $\sigma_1^2$, let $Y_1, \ldots, Y_{25}$ be another random sample (independent of the $X_i's$) from a normal distribution with variance $\sigma_2^2$, and let $S_1^2$ and $S_2^2$ denote the two sample variances. Which of the following statement is **not** true in testing $H_o : \sigma_1^2 = \sigma_2^2$, where the test statistic value is $f = s_1^2 / s_2^2$ and the test is performed at .10 level?

   A. The rejection region is $f \geq F_{.10,19,24}$ if $H_a : \sigma_1^2 > \sigma_2^2$
   B. The rejection region is $f \leq F_{.90,19,24}$ if $H_a : \sigma_1^2 < \sigma_2^2$
   C. The rejection region is either $f \geq F_{.10,19,24}$ or $f \leq F_{.90,19,24}$

   **ANSWER:** C

   [4 points for submission. 3 points for each question. Total is 10.]