

ECO240 Quiz 3 April 27 2018

ID/Name:

From a random sample of 25 students in a statistics class that uses group-learning techniques, the sample mean final exam score was found to be 72 and the sample standard deviation was 5. For an independent random sample of 36 students in another statistics class that does not use group-learning techniques, the sample mean was 60 and the sample standard deviation was 8.

- (a) Test at 5% significance level that population mean score for the class with group-learning techniques is equal to 75 against it is less than 75. Write down all the necessary components for a hypothesis test.

- (b) Suppose that the true population mean for the class with group-learning techniques is 71. Given the setting from part (a), calculate Type II error. (State your answer as a range.)

- (c) Derive 95% confidence interval for the difference between the two population mean scores by not assuming equal population variances. Interpret the result. Use $v = 60$. Set up the difference as $\mu_{group} - \mu_{nongroup}$.

- (d) Test the null hypothesis that the population means are equal against the alternative that the mean scores are different at 10% significance level by not assuming equal population variances. Use $v = 60$. Set up the difference as $\mu_{group} - \mu_{nongroup}$.

v	0.1	0.05	0.025	0.01	0.005
24	1.318	1.711	2.064	2.492	2.797
60	1.296	1.671	2.000	2.390	2.660

Upper Tail	Reject H_0 if $\bar{d} > D_0 + t_{v,\alpha} \sqrt{\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}}$	Lower Tail	Reject H_0 if $\bar{d} < D_0 + t_{v,\alpha} \sqrt{\frac{s_x^2}{n_x} + \frac{s_y^2}{n_y}}$
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