

Question 2

Forty-five (45) dog lovers are recruited for a study examining the calming effects of pets during stressful situations.

Fifteen (15) subjects were randomly assigned to each of three different groups:

- performing the task alone (control),
- performing the task with a good friend present, and
- performing the task with their dog present.

The peak heart rate (in beats per minute) during the task was measured for each subject, with the following results:

	Alone	Good Friend	Pet Dog
Mean	82.52	91.32	73.48
SD	9.24	8.34	9.97

(1 point possible)

2a. What is the appropriate null hypothesis for this test?

☒ $H_0 : \mu_1 = \mu_2 = \mu_3$ ✓☐ $H_0 : \mu_1 \neq \mu_2 \neq \mu_3$ ☐ $H_0 : \mu_1 \neq \mu_2 = \mu_3$

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2b. To run a reliable ANOVA, what must be true of this data?

☐ The heart rate data should be normally distributed in each group.☐ Each group should have approximately equal standard deviations.☐ Each group has independent, random data.☒ All of the above. ✓

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2c. What are the **degrees of freedom** for this test?

Numerator Degree of Freedom

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Answer: 2

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Denominator Degree of Freedom**Answer: 42**

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2d. What is the **critical F** for this test, assuming $\alpha = 0.05$? (Round to 2 decimal places.)

Answer: 3.23

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(1 point possible)

2e. In this problem, you find that $SS_{\text{total}} = 5949.1$ and $SS_{\text{Between}} = 2387.7$. What is the **F statistic** for the test? (Round to 2 decimal places.)

Answer: 14.08


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2f. What is the outcome of this test?

☐ Fail to reject the null hypothesis

☒ Reject the null hypothesis 

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