



“FRAPPY” {Free Response AP Problem...Yay!}

The following problem is taken from an actual Advanced Placement Statistics Examination. Your task is to generate a complete, concise statistical response in 15 minutes. You will be graded based on the AP rubric and will earn a score of 0-4. After grading, keep this problem in your binder for your AP Exam preparation.

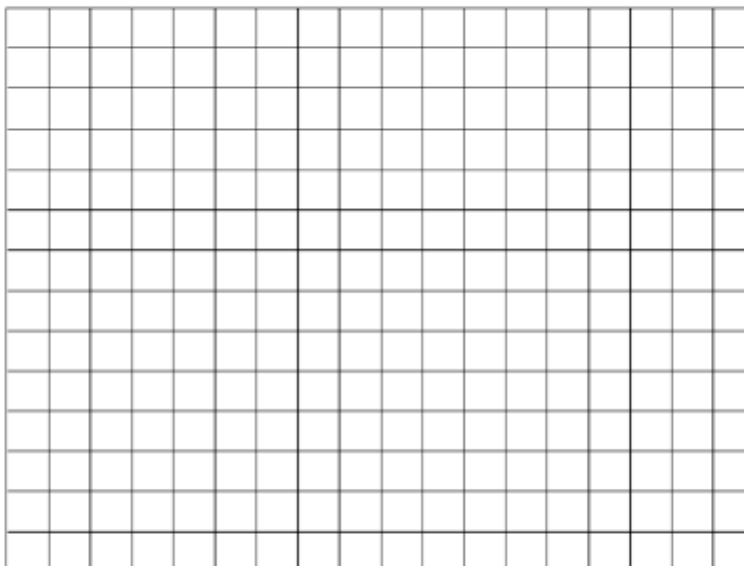
An experiment was conducted to study the effect of temperature on the reliability of an electronic device used in an undersea communications system. The experiment was done in a laboratory where tanks of seawater were maintained at either 10°C , 30°C , 50°C , or 70°C . After the electronic devices were submerged in the tanks for 5,000 hours, each device was inspected to determine if it was still working. The following table provides information on the number of devices tested at each temperature and the number of working devices at the end of the 5,000-hour test.

Seawater temperature	10°C	30°C	50°C	70°C
Number of working devices	29	42	21	12
Number of devices tested	30	50	30	20

You may assume that the result for any single device is not influenced by the result for any other device.

Scoring:

- (a) Using the information in the table, construct a scatterplot that would be useful for showing the effect of water temperature on the ability of the devices to work for at least 5,000 hours.



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(b) Comment on any trend or pattern that is revealed by the scatterplot you constructed.

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(c) An estimate of the proportion of devices that would work after 5,000 hours of submersion in 40 °C seawater can be obtained by averaging the estimates at 30 °C and 50 °C. Compute this estimate and the associated standard error.

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Total: __/4