

AP Statistics Review Problems for Unit I Test
Topics 1-5

A housing development is comprised of 50 homes that are identical in size. They have identical heating systems and lighting arrangements. In a study of energy consumption, the amounts of electricity (in kilowatt hours) used in the separate homes for a 1-month period are as follows.

919	897	968	753	821	978	1021	837	852	691	967	829
1008	1040	924	902	884	836	788	968	950	821	951	815
806	923	926	778	825	851	948	739	909	823	903	1011
741	1000	894	777	994	945	896	903	932	976	841	820
1087	950										

- 1) What is the observational unit in this study?
- 2) Is the variable being measured categorical or quantitative? Explain how you know.
- 3) Construct a frequency table for the data.
- 4) Construct a histogram for the data. Don't forget labels.
- 5) Write a paragraph describing the characteristics of the distribution. Focus on center, spread, shape, gaps, clusters and outliers. Don't forget to include context.

A psychologist has developed a new technique intended to improve rote memory. To test the method against other standard methods, twenty high school students are selected at random and each is taught the new technique. The students are then asked to memorize a list of 100 word phrases using the technique. The following are the number of word phrases memorized correctly by students:

91	64	98	66	83	87	83	86	80	93	83	75
72	79	90	80	90	71	84	68				

- 6) Construct a relative frequency histogram for the data. Don't forget labels.
- 7) Compute the mean, median and mode for the above data set and locate them on the histogram. Do these measures of central tendency appear to locate the center of the distribution of data?
- 8) When the lab assistant for this study entered the data, she transposed the numbers for the first observation. "91" should have been "19". Without recomputing, which measure of central tendency will be most affected? Explain why.

9) One of my AP Statistics classes had a mean score of 10 on a quick quiz. The other class had a mean score of 12 on the same quick quiz. Does this mean that the overall average of the two classes combined is 11? Explain.

10) On the midterm exam for a college statistics course, one instructor records the amount of time (in minutes) that has passed when a student turns in his exam. The exam is designed to be very difficult and most students take the entire 50 minute exam period. Describe the most likely shape of this distribution. Would you expect the mean or median time to be higher? Explain.

11) State the Empirical Rule. Would it be valid to use the Empirical Rule on the distribution described in question #10?

A research cardiologist is interested in the age when adult males suffer their first heart attack. The cardiologist takes a random sample of the medical records of thirty male coronary patients and obtains the following results (recorded in years):

51	64	43	54	52	38	45	70	75	71	49
42	62	55	65	63	40	61	49	57	58	67
53	54	44	59	54	42	60	50			

12) What is observational unit in this study?

13) Compute the sample mean, variance and standard deviation for the data.

14) If the distribution is mound shaped, what percentage of the distribution should fall within one standard deviation of the mean? How close is this percentage to the actual percentage data that fall within one standard deviation of the mean?

15) Construct a boxplot for the data. Don't forget label and scale.

16) Suppose a light bulb manufacturer claims that the mean lifetime of its bulbs is 35 hours. Assume you have prior knowledge that the bulb lifetimes have a mound-shaped distribution with standard deviation 5 hours. If the manufacturer's claim is true, approximately what percentage of light bulbs will burn out in less than 20 hours? Suppose you randomly select one of the bulbs and it burns out in less than 20 hours. Do you suspect the manufacturer's claim is incorrect? Explain your answer.

17) You take one test on spatial perception and your friend takes a different test. For your test, you score 66. This test has a known mean of 75 and a standard deviation of 15. Your friend scores 223 on the other test. This test has a known mean of 250 with a standard deviation of 25. Which result is better? Explain. (Think z-scores.)