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| Problem Set No. 1  **Use the Problem Set 1 Answer Sheet to record your answers.** |
| 1. Identify the scale of measurement most appropriate for each of the following variables. (Use A = *nominal*, B = *ordinal*, C = *interval*, D = *ratio.*) 2. response latency (i.e., the elapsed time between being exposed to a stimulus and responding to that stimulus) 3. motivation measured by scores on the *XYZ Motivation Inventory* 4. political party affiliation (Democrat, Republican, Independent, Other) 5. academic rank in high school 6. scores on the *SAT* or *GRE* 7. Identify the independent and dependent variables in each of the following experiments.  |  |  |  |  | | --- | --- | --- | --- | |  | | Independent | Dependent | |  | a. students are taught statistics either with or without a textbook: then test scores of the two groups are compared |  |  | |  | b. ratings of self-confidence are found to be correlated with high school GPA |  |  | |  | c. fifteen minutes a day practicing shooting 3 point- goals proved more effective than thirty minutes of practice twice a week |  |  |  1. Use the following sets of data to compute the values requested.   Data (X):   9  12  13  14  15  16  16  17  18  20  Data (Y):   2    1    0   -1    2    2   -2     1    0    1   |  |  |  | | --- | --- | --- | | EX = | EX2= | (EX)2 = | | EX + 2 = | E(X+2) = | E(X+2)2 = | | E2X = | E2X + 2 = | E2(X+2) = | | EXY = | EXY + 2 = | E(X+2)(Y+2) = | | EX/N = | EX2/N = | EXY/N = | |  |  |  |  1. Using a table of areas under the normal curve, compute the following. (Note, you can find a table of areas under the normal curve in just about any introductory statistics book.) 2. the proportion of cases below a z-score of  -.72. 3. the proportion of cases below a z-score of  1.65. 4. the proportion of cases above a standard score of 2.0. 5. the proportion of cases above a standard score of -2.5. 6. the proportion of cases between z-scores of -1.5 and 1.5. 7. the proportion of cases between standard scores of 1.5 and 2.5. 8. Assume the mean on an IQ test is 100 with a standard deviation of 16. Using a table of areas under the normal curve, estimate each of the following. 9. the percentage of individuals having an IQ of 130 or higher. 10. the proportion of individuals with an IQ of 90 or lower. 11. the percentage of individuals with IQs between 85 and 115. 12. the proportion of individuals with IQs between the first and third quartiles. 13. the percentage of individuals with IQs above 130. 14. the IQ of individuals at the 85th percentile. 15. the IQ of individuals at the 35th percentile. 16. A survey of 1,000 kindergarten children reveals that the average child watches 145 minutes of TV per week. The *sample* standard deviation is 40 minutes. Construct the 95% confidence to estimate the mean number of minutes spent viewing TV per week in the *population* of kindergarteners. 17. A school district dietitian wants to construct a confidence interval to estimate the mean number of soft drinks high-school students consume daily in her district. She intends to survey the students. Assuming a *population* standard deviation of 1.8 soft drinks a day, per student. 18. how many students must she survey in order to obtain a 95% confidence interval that is .5 soft drinks wide? 19. how many students would she have to survey to obtain a 99% confidence interval that is .5 soft drinks wide? 20. The distribution of SAT-V scores is normal with m = 500 and s = 100.   a. What is the *probability* of someone having an SAT-V score *higher* than 650?  b. What is the *probability* of an SAT-V score *between* 550 and 650?   1. The correlation between SAT scores and first semester GPA in the general population is about .53. What do you suppose is the correlation between SAT and GPA at Harvard? Will it higher, lower, or about the same? Explain your reasoning. 2. The mean GRE score for a sample of 121 students who completed a GRE preparation course was 1030 with a corrected standard deviation of 175. The national mean GRE score is 1000.  Is this difference statistically significant? Do you think the difference is practically significant? Explain your reasoning. |
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