

Midterm 1 Review Sheet (Chpts 1-6)

Know the difference between a population and a sample

Know the difference between a parameter and a statistic. Be able to define these and be able to recognize examples of each (e.g. $\mu = 50$ is an example of which?)

Know the difference between inferential statistics and descriptive statistics.

Be able to define and/or identify the independent and dependent variables in an experiment.

Know the scales of measurement (nominal, ordinal, interval, and ratio) and be able to define each. Be able to give an example of each scale. For any given variable be able to decide which scale the variable is.

Continuous versus discrete variables. What's the difference? Be able to decide which applies to a given variable (e.g. # of children is continuous or discrete?)

Real limits: upper and lower real limits. Know what these are and how to use.

Be sure you can use statistical notation and can compute various sums for a set of numbers (e.g. if the scores are 3, 8, 9, 10, what is $\sum x^2$?)

Be able to construct a simple or group frequency distribution table or frequency distribution graph.

Given a score from such a frequency distribution table be able to find the percentile rank for that score. Given a percentile rank, be able to determine the percentile score corresponding to that rank.

Know the differences amongst a histogram, a bar graph, and a frequency distribution polygon.

Know the three measures of central tendency and how to compute each of them. Know the characteristics of each and the advantages/disadvantages of each. Know when to use each (e.g. if the distribution is skewed, which measure of central tendency should you use?). Know what a weighed mean is and how to calculate the weighted mean.

Know the three characteristics necessary to describe any frequency distribution.

Know the characteristics of distributions: symmetry, skewness, etc.

Know the different measures of variability and how to compute each of them. Know the characteristics of each, the advantages and disadvantages of each, and when to use each of them.

Know the difference between the standard deviation for a population and the standard deviation for a sample (when it is used to estimate the variability in a population) and know how to compute each of them.

Know the definition of z-score and how to compute a z-score for a raw score given the mean and standard distribution of the population from which the score came.

Know the conceptual definition of a z-score (i.e. it is the location of a score in a normal distribution in units of standard deviation).

Be able to find the z-score for a raw score given the mean and standard deviation of the population. Given the z-score or the location of the score in the normal distribution, be able to find the raw score (e.g. given a z of -.75 what is the raw score, assuming a population mean of 50 and a standard deviation of 3).

Know the properties of the standard normal distribution (i.e. mean = 0 and the standard deviation is 1).

Be able to use z scores to compare performance on two different scales.

Know the definition of probability.

Know how to compute probabilities (e.g. given 15 dogs and 25 cats in a room, if I randomly select an animal, what is the probability that the animal will be a cat?)

Know what a random sample is and the two requirements that must be fulfilled for it to be a truly random sample. Which of these two requirements is often not met when we do research and why is this okay?

Given a frequency distribution table or graph be able to compute the probability of obtaining a score or range of scores (e.g. if the scores in a distribution are: 1,1,2,3,3,4,4,4,5,6. If I randomly select a score what is the probability that the score I select will be 2 or less?)

Given a normal distribution for which you know the mean and standard deviation, be able to compute the probability of obtaining a specific range of scores (e.g. given a population with a mean of $\mu = 50$ and a standard deviation of $\sigma = 8$, what is the probability of selecting a score between 35 and 57?) or the proportion of scores within a specific range (e.g. what proportion of the scores are greater than 59?). You should also be able to determine a percentile rank or a percentile score. All of these tasks require using the unit normal curve to convert a question about probability or proportion into finding an area under the unit normal curve or given an area under the curve finding a range of scores that correspond to that area.