

PSYC 240: Statistics in Psychology
ASSIGNMENT 2: DESCRIPTIVE STATISTICS & Z SCORES

Purpose: Most statistical calculations are based, in one way or another, on the mean and standard deviation. This assignment is designed to give you practice in thinking about measures of central tendency and variability. Additionally, standardization is one common way of transforming scores and is especially useful for communicating relative standing in a normal distribution. The problem-based question is designed to give you practice in thinking about and calculating standardized scores.

Short Answer Questions (20 points each): Please provide a typewritten answer to the following essay questions:

1. What are the similarities and differences among the three main measures of variability (i.e., sum of squares, mean squares, and standard deviation)? Be sure to define and describe each in your own words (and not formulas) while making the comparisons among the three.
2. What is the relationship between proportions and probabilities in a normal distribution? Be sure to describe both the similarities and differences among the three measures with specific reference to how they would be calculated in the normal distribution.

Problem-Based Question (60 points)

3. Suppose that an exam is given to a large number of students. When analyzing the scores in terms of percent correct, the instructor notices that the scores are normally distributed with a mean of 75.0 and a standard deviation of 9.1. Using z scores, answer the following questions.
 - a. What percent of the students had a score below 70?
 - b. What percent of students had a score above 80?
 - c. There are *raw scores* so extreme (i.e., both really high and really low) that the probability is 0.10 that they would occur by chance alone. Those raw scores are beyond what values?
 - d. What grade is associated with the 65th percentile?
 - e. Given this distribution, what is the probability of scoring 100 on the exam?
 - f. What is the probability of failing the exam (i.e., scoring below 60)?