Exercise – Standard Scores   Psyc 402 – Spring 2021 – Dr. Diehr
This is for practice and is not scored for points

Goal: understand standard scores, calculate a Z score and convert it an IQ score.
To start: enter the missing Standard Scores on the back of this page.

Definitions:
  M = mean of sample
  S = standard deviation (SD) of sample

Question 1: On a standardized test for 5th grade students, scores ranged from 30 to 90, with a mean of 77, and a standard deviation of 12.   Alice scored 72.   Express her raw score as a Z-score.

  Z   =   Write the Z-score formula using variables.

        =   Replace each variable with a number.

        =   Simplify the numerator of the equation.

        =   Calculate final result (use 3 significant digits: X.XX).

Question 2: Suppose the school provided Alice's Z score to her parents, who are not statisticians.
What are three different reasons they may have trouble understanding the meaning:

  A.

  B.

  C.

Question 3: Convert Alice's Z score to an IQ score (IQ scores have M=100 and S=15).

  IQ   =   Write the Z-score formula using variables.

        =   Replace each variable with actual number.

        =   Calculate final result.

Question 4: Describe one way that an IQ score might easier for Alice's parents to understand than the Z score, and one way it could be harder:

  Easier:

  Harder:

Percent of cases within each range

Standard Deviations

Percentile rank

Z score

T score

IQ score

Normal, Bell-shaped Curve

.13% 2.14% 13.59% 34.13% 34.13% 13.59% 2.14% .13%

-4σ -3σ -2σ -1σ 0 +1σ +2σ +3σ +4σ

Standard Scores

1 5 10 20 30 40 50 60 70 80 90 95 99