

Comparing the relative sizes of data values based on their z-scores

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For admission to graduate school, Scott is taking the chemistry subject-matter test, and Carlos is taking the mathematics subject-matter test. Scott scored 535 on the chemistry test, and Carlos scored 598 on the mathematics test.

For each of these subject-matter tests, the distribution of scores is clearly skewed (not approximately symmetric). Scores for the chemistry test have a population mean of 588 points with a standard deviation of 46 points. Scores for the mathematics test have a population mean of 638 points with a standard deviation of 23 points.

- (a) Find the z-scores of Scott's performance as a score on the chemistry test and Carlos's performance as a score on the mathematics test. Round your answers to two decimal places.

z-score of Scott's score:
 z-score of Carlos's score:

$$\text{Scott} \quad \frac{535 - 588}{46}$$

$$\text{Carlos} \quad \frac{598 - 638}{23}$$

- (b) Relative to his population, who scored lower?

Choose the best answer based on the z-scores of the two test scores.

- ☐ Scott
☐ Carlos

☒ It is unclear who scored lower relative to his population

Z-score - Standardizes data
 How many std away from the mean

$$Z = \frac{x - \mu}{\sigma} = \frac{\text{data value} - \text{mean}}{\text{std}}$$