

5.2.1: Practice Calculating z-scores

✓ Example 5.2.1.1

Assume the following scores represent a sample of statistics classes taken by five psychology professors: 2, 3, 5, 5, 6. If the standard deviation is 1.64, what is the z-score for each of these professor's?

Solution

The mean is 4.2 stats classes taken ($\bar{X} = \frac{\sum X}{N} = \frac{21}{5} = 4.2$).

$$z_2 = \frac{x - \bar{X}}{s} = \frac{2 - 4.2}{1.64} = \frac{-2.2}{1.64} = -1.34$$

$$z_3 = \frac{x - \bar{X}}{s} = \frac{3 - 4.2}{1.64} = \frac{-1.2}{1.64} = -0.73$$

$$z_{both5} = \frac{x - \bar{X}}{s} = \frac{5 - 4.2}{1.64} = \frac{0.80}{1.64} = 0.49$$

$$z_6 = \frac{x - \bar{X}}{s} = \frac{6 - 4.2}{1.64} = \frac{1.8}{1.64} = 1.10$$

PS You might want to practice calculating the standard deviation yourself to make sure that you haven't forgotten how!

Your turn!

? Exercise 5.2.1.1

Calculate z-scores for the three IQ scores provided, which were taken from a population with a mean of 100 and standard deviation of 16: 112, 109, 88.

Answer

$$z_{112} = 0.75$$

$$z_{109} = 0.56$$

$$z_{88} = -0.75$$

This time, you'll get the z-score and will need to find the IQ scores. Remember, you can do this with the z-score formula that you used above and to algebra to find x , or you can use the other z-score formula.

? Exercise 5.2.1.2

Use the z-scores provided to find two IQ scores taken from a population with a mean of 100 and standard deviation of 16:

$$z = 2.19$$

$$z = -0.06$$

Answer

The IQ scores are 135 (for $z = 2.19$) and 99 ($z = -0.06$).

Contributors and Attributions

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