How can I perform the ZTEST function in Excel?

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The ZTEST function in Excel is a statistical tool that allows users to determine the probability of a sample mean being equal to a population mean. It is commonly used in hypothesis testing and requires two sets of data: the sample data and the population data. To perform the ZTEST function in Excel, one must first select a cell where the result will be displayed. Then, the function can be accessed by typing "=ZTEST(" into the cell, followed by selecting the sample data range and the population data range. Finally, the function can be completed by pressing Enter. The result will be a decimal value between 0 and 1, representing the probability of the sample mean being equal to the population mean. This function can be a valuable tool for analyzing and interpreting data in various fields such as business, economics, and science.

This article describes the formula syntax and usage of the **ZTEST** function in Microsoft Excel.

Returns the one-tailed probability-value of a z-test. For a given hypothesized population mean, μ0, ZTEST returns the probability that the sample mean would be greater than the average of observations in the data set (array) -- that is, the observed sample mean.

To see how ZTEST can be used in a formula to compute a two-tailed probability value, see "Remarks" below.

Important: This function has been replaced with one or more new functions that may provide improved accuracy and whose names better reflect their usage. Although this function is still available for backward compatibility, you should consider using the new functions from now on, because this function may not be available in future versions of Excel.

For more information about the new function, see Z.TEST function.

Syntax

ZTEST(array,x,)

The ZTEST function syntax has the following arguments:

Array Required. The array or range of data against which to test x.

X Required. The value to test.

Sigma Optional. The population (known) standard deviation. If omitted, the sample standard deviation is used.

Remarks

If array is empty, ZTEST returns the #N/A error value.

ZTEST is calculated as follows when sigma is not omitted:

$$ZTEST(array, \mu_0) = 1 - NORMSDIST((\bar{x} - \mu_0)/(sigma / \sqrt{n}))$$

or when sigma is omitted:

$$ZTEST(array, \mu_0) = 1 - NORMSDIST((\bar{x} - \mu_0)/(s / \sqrt{n}))$$

where x is the sample mean AVERAGE(array); s is the sample standard deviation STDEV(array); and n is the number of observations in the sample COUNT(array).

ZTEST represents the probability that the sample mean would be greater than the observed value AVERAGE(array), when the underlying population mean is μ0. From the symmetry of the Normal distribution, if AVERAGE(array) < μ0, ZTEST will return a value greater than 0.5.

The following Excel formula can be used to calculate the two-tailed probability that the sample mean would be further from μ0 (in either direction) than AVERAGE(array), when the underlying population mean is μ0:

=2 * MIN(ZTEST(array,μ0,sigma), 1 - ZTEST(array,μ0,sigma)).

Example

Copy the example data in the following table, and paste it in cell A1 of a new Excel worksheet. For formulas to show results, select them, press F2, and then press Enter. If you need to, you can adjust the column widths to see all the data.

Data		
3		
6		
7		
8		

Data		
6		
5		
4		
2		
1		
9		
Formula	**Description (Result)**	**Result**
=ZTEST(A2:A11,4)	One-tailed probability-value of a z-test for the data set above, at the hypothesized population mean of 4 (0.090574)	0.090574
=2 * MIN(ZTEST(A2:A11,4), 1 - ZTEST(A2:A11,4))	Two-tailed probability-value of a z-test for the data set above, at the hypothesized population mean of 4 (0.181148)	0.181148
=ZTEST(A2:A11,6)	One-tailed probability-value of a z-test for the data set above, at the hypothesized population mean of 6 (0.863043)	0.863043
=2 * MIN(ZTEST(A2:A11,6), 1 - ZTEST(A2:A11,6))	Two-tailed probability-value of a z-test for the data set above, at the hypothesized population mean of 6 (0.273913)	0.273913