

How do I use the WEIBULL.DIST function in Excel?

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The WEIBULL.DIST function in Excel is a statistical function used to calculate the Weibull distribution, which is commonly used in reliability analysis. To use this function, you must provide the required arguments of x (the value at which the distribution will be evaluated), alpha (the shape parameter), and beta (the scale parameter). Additionally, you can specify whether you want to use the cumulative distribution (TRUE) or the probability density function (FALSE). This function can be useful in predicting the probability of failure or survival of a product or system. It is commonly used in engineering, economics, and other fields. To use the WEIBULL.DIST function, simply enter the function name, followed by the required arguments, into a cell in your Excel worksheet.

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

Returns the Weibull distribution. Use this distribution in reliability analysis, such as calculating a device's mean time to failure.

Syntax

WEIBULL.DIST(x,alpha,beta,cumulative)

The WEIBULL.DIST function syntax has the following arguments:

X Required. The value at which to evaluate the function.

Alpha Required. A parameter to the distribution.

Beta Required. A parameter to the distribution.

Cumulative Required. Determines the form of the function.

Remarks

If x, alpha, or beta is nonnumeric, WEIBULL.DIST returns the #VALUE! error value.

If $x < 0$, WEIBULL.DIST returns the #NUM! error value.

If $\alpha \leq 0$ or if $\beta \leq 0$, WEIBULL.DIST returns the #NUM! error value.

The equation for the Weibull cumulative distribution function is:



The equation for the Weibull probability density function is:



When alpha = 1, WEIBULL.DIST returns the exponential distribution with:

$$f = \frac{1}{\beta}$$

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	Description	
105	Value at which to evaluate the function	
20	Alpha parameter to the distribution	
100	Beta parameter to the distribution	
Formula	Description (Result)	Result
=WEIBULL.DIST(A2,A3,A4,TRUE)	Weibull cumulative distribution function for the terms above (0.929581)	0.929581
=WEIBULL.DIST(A2,A3,A4,FALSE)	Weibull probability density function for the terms above (0.035589)	0.035589