# NORMDIST

Show All

Returns the normal distribution for the specified mean and standard deviation. This function has a very wide range of applications in statistics, including hypothesis testing.

**Syntax**

**NORMDIST**(**x**,**mean**,**standard_dev**,**cumulative**)

**X** is the value for which you want the distribution.

**Mean** is the arithmetic mean of the distribution.

**Standard_dev** is the standard deviation of the distribution.

**Cumulative** is a logical value that determines the form of the function. If cumulative is TRUE, NORMDIST returns the cumulative distribution function; if FALSE, it returns the probability mass function.

**Remarks**

- If mean or standard_dev is nonnumeric, NORMDIST returns the #VALUE! error value.
- If standard_dev ≤ 0, NORMDIST returns the #NUM! error value.
- If mean = 0, standard_dev = 1, and cumulative = TRUE, NORMDIST returns the standard normal distribution, NORMSDIST.
- The equation for the normal density function (cumulative = FALSE) is:

$$f(x,\mu,\sigma) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\left(\frac{(x-\mu)^2}{2\sigma^2}\right)}$$

- When cumulative = TRUE, the formula is the integral from negative infinity to x of the given formula.

**Example**

The example may be easier to understand if you copy it to a blank worksheet.

How to copy an example

| A | B |
|---|---|

| | | |
|---|---|---|
| **1** | **Data** | **Description** |
| **2** | 42 | Value for which you want the distribution |
| **3** | 40 | Arithmetic mean of the distribution |
| **4** | 1.5 | Standard deviation of the distribution |
| | **Formula** | **Description (Result)** |
| | =NORMDIST(A2,A3,A4,TRUE) | Cumulative distribution function for the terms above (0.908789) |
| | =NORMDIST(A2,A3,A4,FALSE) | Probability mass function for the terms above (0.10934005) |

**See Also**

- NORMINV
- NORMSDIST
- NORMSINV
- STANDARDIZE
- Statistical functions
- ZTEST