

How can I use the TINV function in excel to calculate the inverse of a given probability?

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The TINV function in Excel is a mathematical tool that allows users to calculate the inverse of a given probability. This function is useful for statistical analysis and can provide valuable information for decision making. To use the TINV function, one must input the probability and the degrees of freedom, which represent the sample size minus one. Once the function is executed, it will return the inverse of the probability, which can be interpreted as the cutoff point for a given confidence level. This function is particularly helpful in analyzing data sets and making informed decisions based on statistical probabilities.

Returns the two-tailed inverse of the Student's t-distribution.

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 functions, see [T.INV.2T function](#) or [T.INV function](#).

Syntax

TINV(probability,deg_freedom)

The TINV function syntax has the following arguments:

Probability Required. The probability associated with the two-tailed Student's t-distribution.

Deg_freedom Required. The number of degrees of freedom with which to characterize the distribution.

Remarks

If either argument is nonnumeric, TINV returns the #VALUE! error value.

If probability ≤ 0 or if probability > 1 , TINV returns the #NUM! error value.

If deg_freedom is not an integer, it is truncated.

If deg_freedom < 1 , TINV returns the #NUM! error value.

TINV returns that value t , such that $P(|X| > t) = \text{probability}$ where X is a random variable that follows the t-distribution and $P(|X| > t) = P(X < -t \text{ or } X > t)$.

A one-tailed t-value can be returned by replacing probability with $2 * \text{probability}$. For a probability of

0.05 and degrees of freedom of 10, the two-tailed value is calculated with $TINV(0.05,10)$, which returns 2.28139. The one-tailed value for the same probability and degrees of freedom can be calculated with $TINV(2*0.05,10)$, which returns 1.812462.

Note: In some tables, probability is described as $(1-p)$.

Given a value for probability, TINV seeks that value x such that $TDIST(x, deg_freedom, 2) =$ probability. Thus, precision of TINV depends on precision of TDIST. TINV uses an iterative search technique. If the search has not converged after 100 iterations, the function returns the #N/A error value.

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 | |
|--------------|--|--------|
| 0.05464 | Probability associated with the Student's two-tailed t-distribution | |
| 60 | Degrees of freedom | |
| Formula | Description | Result |
| =TINV(A2,A3) | The t-value of the Student's t-distribution based on the arguments in A2 and A3. | 1.96 |