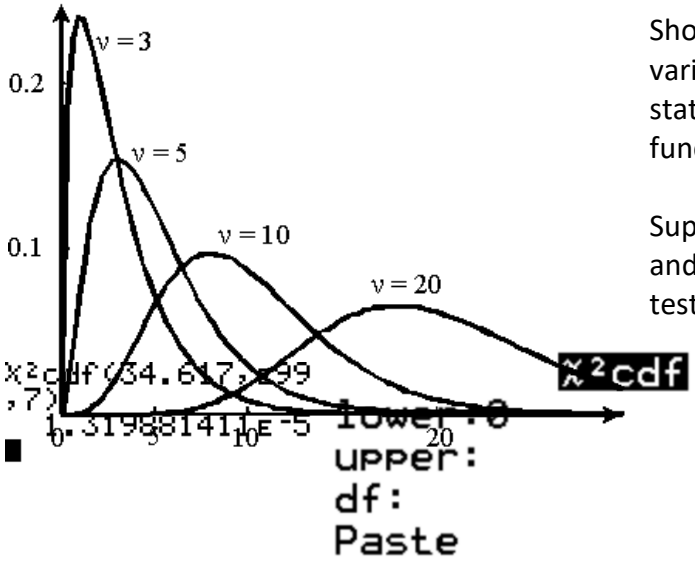
TI-84 χ^2 Distribution Function

The χ^2 distribution is a probability distribution that is an asymmetric distribution used to analyze certain types of hypothesis tests.

To use the χ^2 distribution in the calculator, go to the DISTR menu by hitting [2nd] [VARS]. Scroll down to options #7 and #8 on this menu to find χ^2**pdf** and χ^2**cdf**. The χ^2**cdf** function is the distribution we will use for hypothesis tests. We need to specify two values for the region we will be testing, an interval bounded by a lower value (the value we obtain from our test statistic) and an upper value, such as 10^{99}. We will also need to specify the number of degrees of freedom we are using. How to calculate the degrees of freedom (v) is specified by the test statistic: χ^2**cdf(lower, upper, df)**.



Shown here is a graph of the χ^2 distribution for various degrees of freedom. To convert a χ^2 test statistic to a probability, fill in syntax for the function as shown above.

Suppose that we have performed a hypothesis test and obtained the test statistic χ^2=34.617, and our test has 7 degrees of freedom.

Click on #8 from the DISTR menu for χ^2**cdf(**, and followed by 34.617, comma [,] (above the 7), E [2nd] [,] 99, comma [,], 7, then close the parentheses. The screenshot (left) shows what your screen syntax will look like. Alternatively, the screenshot on the right shows what the StatWizard screen will display. Enter the same values in the same order: 34.617 for "lower", E99 for "upper" an then 7 for degrees of freedom ("df"). Then select paste and the syntaxt you see on the left will appear on screen. Press [ENTER] to obtain the value. The value you obtain is the P-value associated with your test, the area under the tail of the distribution past the test statistic value. Compare this information to α to determine whether to accept or reject the null hypothesis H_0.

It is very uncommon to use the χ^2**pdf** function.

Many of the tests in the TI-84 that use the χ^2 test compute the P-values for you, so you would only need this if you are computing the test statistic by hand, or for a test which is not on the TI-84.

χ^2cdf(lower, upper, df)