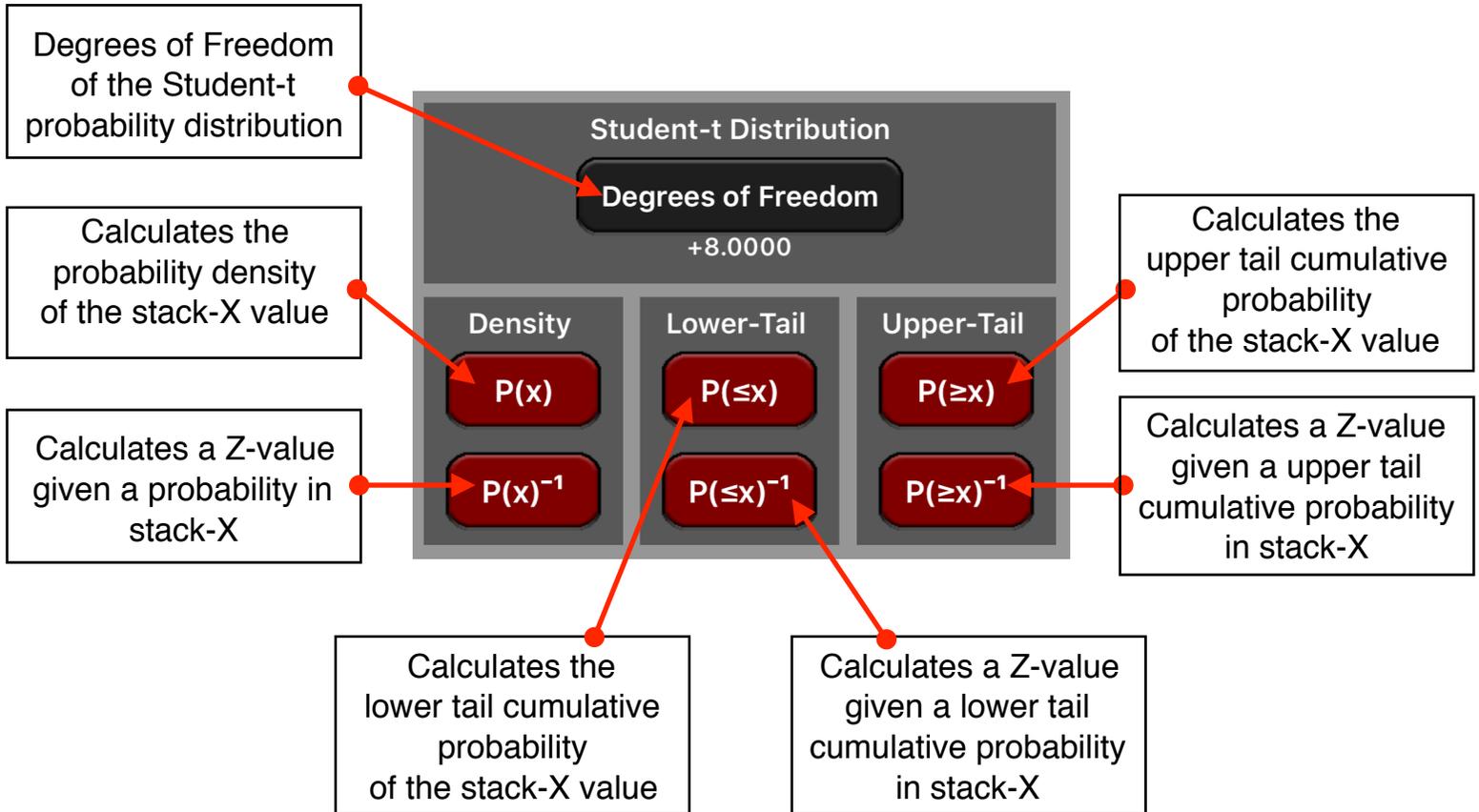


# Student-t Distribution Tool

This tool adds the Student-t probability distribution to expand the original HP-11C calculator. To show it, press the **OPT** key, touch the “**Statistics**” menu button, and select the “**Student-t Distribution**” tool.



The following examples assume the “Probability Calculations” tool is already visible in the calculator and the display format is set to “FIX” with 6 decimal places ( **[ f ] [FIX] [6]** ).

**Example 1: (Student-t probability density)**

The variable Z is a student-t random variable with a degrees of freedom of 35. What is the probability that Z is 0.5?

Keystrokes	Description
“35” [Degrees of freedom]	Type the degrees of freedom and enter it.
Type “0.5”	Type the z-value
<b>[ P(x) ]</b>	Calculate the probability. <b>Result = 0.348473</b>

What is the z-value with probability of 1%?

Keystrokes	Description
Type “0.01”	Type the probability (1%)
<b>[ P(x)<sup>-1</sup> ]</b>	Calculate the z-value. <b>Result = -2.817329</b> in stack-X and <b>2.817329</b> in stack-Y. Both values are solutions

**Example 2: (Student-t Lower-Tail Probability)**

The variable Z is a standard student-t random variable with 8 degrees of freedom. What is the probability that Z is less than -1.7.?

Keystrokes	Description
“8” [Degrees of freedom]	Type the mean and enter it.
Type “1.7” [CHS]	Type the z-value
<b>[ P( ≤ x) ]</b>	Calculate the probability. <b>Result = 0.063776</b>

**Example 3: (Inverse Student-t Lower Tail Probability)**

What is the z-value corresponding to a lower tail cumulative probability of .025?

Keystrokes	Description
Type "0.025"	Type the probability
<b>[ P( ≤ x)-1 ]</b>	Calculate the corresponding z-value. <b>Result = -2.306004</b>

**Example 4: (Student-t Upper Tail Probability)**

The variable Z is a standard normal random variable. What is the probability that z is greater than 1.5 or less than -1.0?

Keystrokes	Description
Type "1.5"	Type the z-value
<b>[ P( ≥ x)]</b>	Calculate the Upper-Tail probability. <b>Result = 0.086002</b>
<b>Type "1" [CHS]</b>	restore the z-value and change sign
<b>[ P( ≤ x)]</b>	Calculate the Lower-Tail probability. <b>Result = 0.173297</b>
<b>[+]</b>	Add the Upper & Lower probabilities. <b>Result = 0.259298</b>