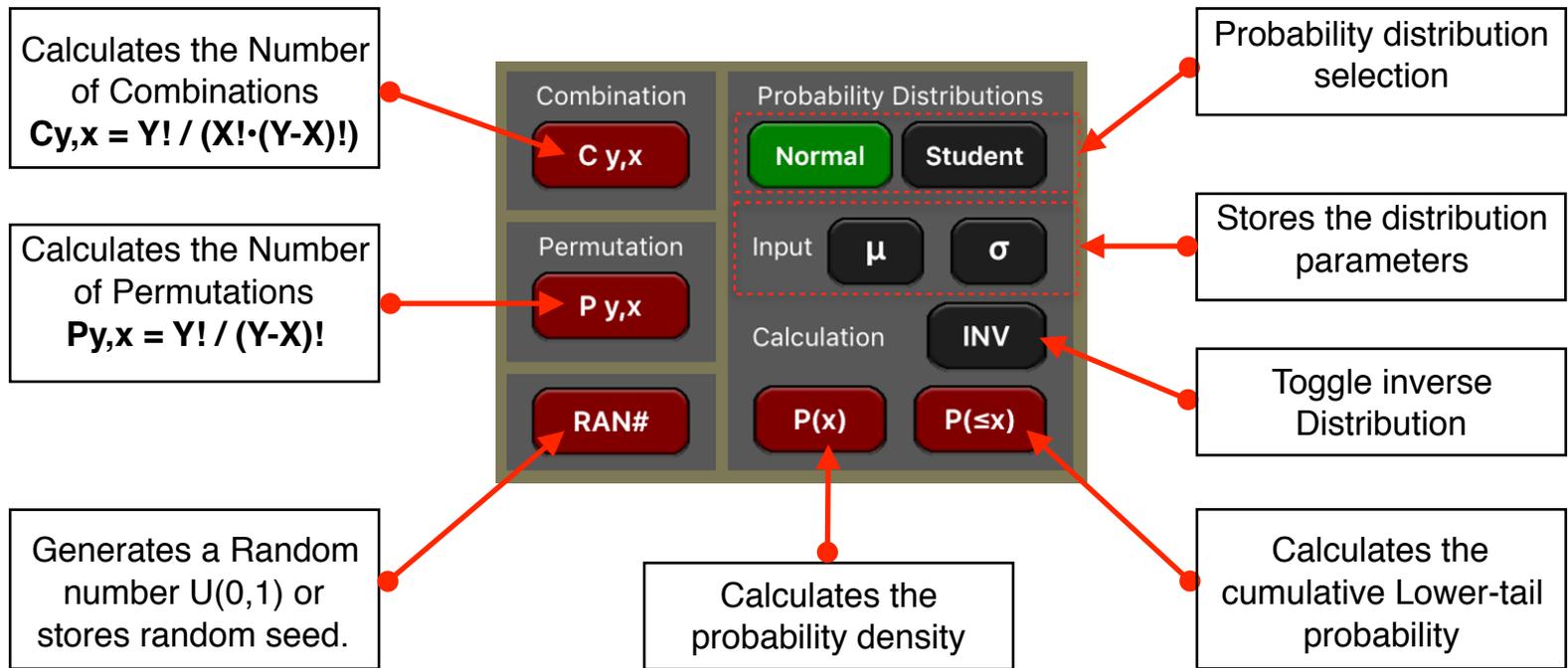


Probability “Pro” Tool

This tool adds common probability functions to expand the original HP-12C calculator. To show it, press the **OPT** key, touch the “Statistics” menu button, and select the “Probability” tool.



The Pseudo-Random Number generator uses the number stored in the **[RAN#]** as a seed to calculate a Uniformly distributed random number between “0” and “1”. To reset the random seed to produce the same sequence of numbers, type the initial seed and press **[STO] [RAN#]**.

The following examples assumes the “Probability Calculations” tool is already visible in the calculator.

Example: Combinations

Using 10 colored balls, how many different color combinations of three colors can be chosen?

Keystrokes	Description
Type "10" [ENTER]	Type the number of total items (10 colored balls).
Type "3" [Cy,x]	Type the size of the sample (3 balls) and calculate the number of possible combinations. Result = 120.00

Example: Permutations

Using 5 books labeled A, B, C, D and E, how many different ways can three books be placed on a shelf?

Keystrokes	Description
Type "5" [ENTER]	Type the number of total items (5 books).
Type "3" [Py,x]	Type the size of the sample (3 books) and calculate the number of possible permutations. Result = 60.00

Example: Random Number Generator

Store a seed value of 42 and generate a sequence of 5 random numbers.

Keystrokes	Description
Type "42" [STO] [RAN#]	Store the initial random seed.
[RAN#]	Generate the 1st random number. Result = 0.7431
[RAN#]	Generate the 2nd random number. Result = 0.0673
[RAN#]	Generate the 3rd random number. Result = 0.1505
[RAN#]	Generate the 4th random number. Result = 0.9077

Normal Probability Distribution Example

Normal Distribution Lower Tail Probability

What is the probability of a Normal random variable with a mean of 7.35 and a standard deviation of 2.33 is less than 5.35 ?.

Keystrokes	Description
[Normal]	Select the Normal Probability Distribution
"7.35" [μ]	Type the mean and enter it.
"2.33" [σ]	Type the standard deviation and enter it.
Type "5.35"	Type the z-value
[P(\leq x)]	Calculate the probability. Result = 0.1953

Inverse of Normal Distribution Lower Tail Probability

What if the z-value corresponding to a lower tail normal cumulative of 0.025 ?.

Keystrokes	Description
Type "0.025"	Type the probability
[INV]	Set Inverse function
[P(\leq x)]	Calculate the corresponding z-value. Result = 2.7833

Student-t Probability Distribution Example

Student's "t" Distribution Lower Tail Probability

What is the lower tail probability associated with a Student's T distribution with 8 degrees of freedom (df1) with a t-value of -1.86?

Keystrokes	Description
[Student]	Select the Student Probability Distribution
Type "8" [Deg. of Free]	Enters the Student's "t" degrees of freedom
type "1.86" [CHS]	Type the z-value
[P(≤ x)]	Calculate the probability. Result = 0.049965

Inverse of Student's T "t" Lower Tail Probability

A hypothesis test requires a critical t-value from Student's "t" distribution with 26 degrees of freedom. Find the t-value for a lower tail probability of 0.05.

Keystrokes	Description
Type "26" [Deg. of Free]	Enters the Student's "t" degrees of freedom
Type "0.05"	Type the probability
[INV]	Set Inverse function
[P(≤ x)]	Calculate the corresponding t-value. Result = -1.705618