Finding the Area Under a Normal Curve

This guide demonstrates how to find the area under the normal curve using formulas and the Distribution Calculator.

Column Formula for Area Under a Normal Curve (One Value)

1. Select **File > New > Data Table**.
2. Add one row - select **Rows > Add Rows**, and type "1". Click **OK**.
3. Right-click on **Column 1**, and select **Formula** to access the Formula Editor.
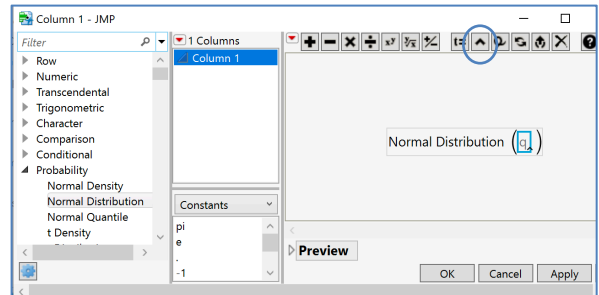4. From the function list on the left, select **Probability > Normal Distribution.**
   This will give the following formula:

   Normal Distribution (q)   Returns the probability that a normally distributed random variable is less than q.

5. Click the caret on the keypad twice to add fields for the mean and standard deviation.

   Normal Distribution (q , <mu=0> , <sigma=1>)

6. In the fields provided, enter the value of q, the mean, and the standard deviation. Click **OK**.
   - JMP® will populate the row in the data table with the cumulative probability value (the area under the lower tail of the normal curve).

   Note: To find the area in the upper tail, or the area between two values, use the following formulas:

   - Upper tail:
     1 - Normal Distribution (q , <mu=0> , <sigma=1>)

   - Between two values:
     Normal Distribution (q , <mu=0> , <sigma=1>) - Normal Distribution (q , <mu=0> , <sigma=1>)

Note: The **Distribution Calculator** provides an interactive tool to calculate and visualize areas under various distsributions (shown on the right). See the "Interactive Tools for Teaching and Learning" guide in "Chapter 2: JMP Basic" to learn how to access.
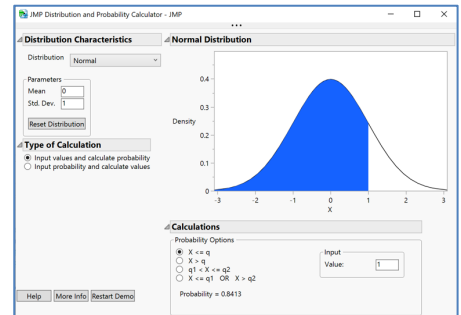
Column Formula for Area under a Normal Curve (for a Column of Values)

1. Open an existing data table (**File > Open**), or open a new data table (**File > New > Data Table**) and create a column of values.
2. Select **Cols > New Column** to create an additional column, and rename the column. We'll name our column **Prob Height**.
3. Click **Column Properties**, and select **Formula** to access the Formula Editor.
4. Complete the formula using one of the two options shown to the right (type in the mean and standard deviation values into the appropriate fields or use the **Col Mean** and **Col Std Dev** functions.
   JMP will populate the new column with cumulative probability values for each value in the column.

Big Class.jmp (Help > Sample Data Folder)

name	age	sex	height	weight	Prob Height
KATIE	12	F	59	95	0.2012220526
LOUISE	12	F	61	123	0.3573444607
JANE	12	F	55	74	0.0374839749
JACLYN	12	F	66	145	0.7920856365
LILLIE	12	F	52	64	0.0064194391
TIM	12	M	60	84	0.2737817738
JAMES	12	M	61	128	0.3573444607

Normal Distribution (height , 62.55 , 4.24)

Normal Distribution (height , Col Mean (height) , Col Std Dev (height))

Visit **Using JMP > Create Formulas in JMP** in **JMP Help** to learn more.