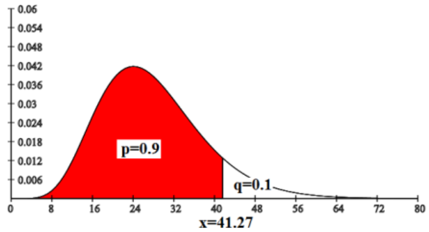

Continuous Distributions

There are three versions for parameter entry for each of the continuous distributions:

[1] Parameters such as degrees of freedom (df) or scale (λ) are entered manually. If the value of p (area on the left) is entered, then the quantile (x) will be found when the evaluate button is pressed. The results are illustrated graphically.

[2] Parameters are entered by the sliders within their allowable ranges. When p is changed, or if any of the parameters are changed, a new value of the quantile (x) will appear.

[3] Parameters are entered by the sliders within their allowable ranges. When the quantile (x) is changed, or if any of the parameters are changed, a new value of the probability (p) will appear.

f(x) = probability density function has the properties: $f(x) \geq 0$ for all x and $\int_{-\infty}^{\infty} f(t)\,dt = 1$

$$p = P(x) = \int_{-\infty}^{x} f(t)\,dt \qquad q = 1 - p = Q(x) = \int_{x}^{\infty} f(t)\,dt$$

The definitions and properties of these distributions are given at:

http://www.interactive-math.org/statistics/probdist.pdf and
http://www.interactive-math.org/statistics/JohnsonSystemDistributions.pdf

Interrelationships among these distributions are given at:

http://www.interactive-math.org/statistics/dist_interrelations.pdf

Distributions:

The normal/Gaussian (I am a doctoral mathematical descendent of Gauss), along with the Student-t, Chi-Square, and F distributions are standard in beginning undergraduate statistics classes. The gamma and beta distributions are discussed in higher level mathematical statistics classes. The Johnson system of functions (lognormal, Johnson-SB, and Johnson-SU) are transformed from the normal distribution and can be used for curve fitting skewed (non-symmetric) distributions.

Example:

Consider the Chi-Square distribution.

The density function is shown on top.

Sliders are used to select the degrees of freedom (36) and p (0.95). The value of the quantile (x) is 50.998406. The area in red (p) is 0.95 and the area in white (q) is 0.05.

The reset may be used to restore default values. A reload/refresh will also restore values to the default values and redraw the graph.