which may be easier to compute numerically. Note that

4 Beta

Two shape parameters

$$a, b > 0$$

$$f(x; a, b) = \frac{\Gamma(a + b)}{}$$

$$f\,(x;\nu) \quad = \quad x^{\nu-1}e^{-x}$$

$$f(x;c) \quad = \quad c$$

18 Exponentiated Weibull

Two positive shape parameters a and c and x $(0, \infty)$

$$\begin{aligned} f(x; a, c) &= ac\left[1 - \exp\left(-x^{c}\right)\right]^{a-1} \exp\left(-x^{c}\right) x^{c-1} \\ F(x; a, c) &= \left[1 - \exp\left(-x^{c}\right)\right]^{a} \\ G(q; a, c) &= \left(-\log\left(1 - q^{1/a}\right)\right)^{1/c} \end{aligned}$$

19 Exponential Power

One positive shape parameter b. Defined for $x \geq 0$.

$$\begin{aligned} f(x; b) &= ebx^{b-1} \exp\left(x^{b} - e^{x^{b}}\right) \\ F(x; b) &= 1 - \exp\left(1 - e^{x^{b}}\right) \\ G(q; b) &= \log^{1/b}\left[1 - \log\left(1 - q\right)\right] \end{aligned}$$

20 Fatigue Life (Birnbaum-Sanders)

This distribution's pdf is the average of the inverse-Gaussian ($\mu = 1$) and reciprocal inverse-Gaussian pdf ($\mu = 1$). We follow the notation of JKB here with $\beta = S.$ for $x > 0$

$$f(x; c) = \quad x + 1$$

$$
\begin{aligned}
f(x; c, d) &= \frac{cx^{c-1}}{(1+x^c)^2} I_{(0,\infty)}(x) \\
F(x; c, d) &= \left(1 + x^{-c}\right)^{-1} \\
G(\alpha; c, d) &= \left(\alpha^{-1} - 1\right)^{-1/c} \\
\mu &= \Gamma\left(1 - \frac{1}{}\right.
\end{aligned}
$$

$$M(t) = \exp\left[\frac{t}{2}(t-2c)\right]\left(1+e^{2ct}\right)$$

$$\begin{aligned}
k &= \operatorname{erf}\left(\frac{c}{\sqrt{2}}\right)\\
p &= \exp\left(-\frac{c^2}{2}\right)\\
\mu &= \sqrt{\frac{2}{\pi}}\,p + ck\\
\mu_2 &= c^2 + 1 - \mu^2\\
\gamma_1 &= \frac{\sqrt{\frac{2}{\pi}}\,p^3 \ldots \sqrt{\frac{\pi}{p^2}}\left(2c^2+1\right) \ldots ck\left(6p^2 + 3cpk\sqrt{2\pi} + \pi c\left(k^2-1\right)\right) \ldots}{\pi \mu_2^{3/2}} = \ldots c^4 + 6c^2 + 3 + 6\left(c^2+1\right)\mu^2 - 3\mu^4 - 4p\mu \ldots \sqrt{\frac{2}{\pi}}\left(c^2+2\right) + ck
\end{aligned}$$

μ

29 Generalized Pareto

38 HalfCauchy

If Z is Hyperbolic Secant distributed then e

40 Half-Logistic

In the limit as $c \to \infty$ for the generalized half-logistic we have the half-logistic defined over $x \geq 0.$ Also, the distribution of $|X|$ where X has logistic distribtution.

$$f(x) = \frac{2e^{-x}}{(1+e^{-x})^2} = \frac{1}{2}\operatorname{sech}^2\left(\frac{x}{2}\right)$$

$$F(x) \quad (x) =$$

=

47 Johnson SU

Defined for all x with two shape parameters a and $b > 0$.

$$
\begin{aligned}
f(x; a, b) &= \frac{b}{\sqrt{x^2+1}}\phi\left(a + b\log\left(x + \sqrt{x^2+1}\right)\right) \\
F(x; a, b) &= \Phi\left(a + b\log\left(x + \right)\right)
\end{aligned}
$$

$$
\begin{aligned}
f(x) &= \frac{\exp(-x)}{[1+\exp(-x)]^2} \\
F(x) &= \frac{1}{1+\exp(-x)} \\
G(q) &= -\log(1/q-1)
\end{aligned}
$$

$$\mu = \gamma + \psi_0(1) = 0$$

μ

$$
\begin{aligned}
\mu &= \mu_1 \\
\mu_2 &= \mu_2 - \mu^2 \\
\gamma_1 &= \frac{\mu_3 - 3\mu\mu_2 - \mu^3}{\mu_2^{3/2}} \\
\gamma_2 &= \frac{\mu_4 - 4\mu\mu_3 - 6\mu^2\mu_2 - \mu^4}{\mu_2^2} - 3
\end{aligned}
$$

54 Log Normal (Cobb-Douglass)

Has one shape parameter $\sigma > 0$. (Notice that the "Regress" $A = \log S$ where S is the scale parameter and A

56 Noncentral beta*

Defined over x $[0, 1]$ with $a > 0$ and $b > 0$ and c

where U and χ_ν are independent and distributed as a standard normal and chi with

$$\mu = 2^{\frac{\square}{2}}$$

65 Pareto Second Kind (Lomax)

$c > 0.$ This is Pareto of the first kind with $L = -1.0$ so $x \geq 0$

$$f(x;c) = \quad c$$

$$
\begin{aligned}
\mu &= \frac{\pi}{2} \\
\mu_2 &= \frac{4-\pi}{2} \\
\gamma_1 &=
\end{aligned}
$$

73 Reciprocal Inverse Gaussian

The pdf is found from the inverse gaussian (IG), $f_{RIG}(x;\mu) = \frac{1}{x^2} f_{IG}\left(\frac{1}{x};\mu\right)$ defined for $x \geq 0$ as

$$f_{IG}(x;\mu) = \frac{1}{\quad}$$

$$
\begin{aligned}
m_n = m_d = \mu &= 0 \\
\mu_2 &= \frac{\nu}{\nu - 2} \quad \nu > 2 \\
\gamma_1 &= 0 \quad \nu > 3 \\
\gamma_2 &= \frac{6}{\nu - 4} \quad \nu >
\end{aligned}
$$

As $\nu \rightarrow \infty$

μ