```
> restart;
  read("c:/appl/appl7.txt");
```

PROCEDURES:

AllPermutations(n), AllCombinations(n, k), Benford(X), BootstrapRV(Data),
CDF:CHF:HF:IDF:PDF:SF(X, [x])), CoefOfVar(X), Convolution(X, Y),
ConvolutionIID(X, n), CriticalPoint(X, prob), Determinant(MATRIX), Difference(X, Y),
Display(X), ExpectedValue(X, [g]), KSTest(X, Data, Parameters), Kurtosis(X),
Maximum(X, Y), MaximumIID(X, n), Mean(X), MGF(X), Minimum(X, Y),
MinimumIID(X, n), Mixture(MixParameters, MixRVs),
MLE(X, Data, Parameters, [Rightcensor]), MLENHPP(X, Data, Parameters, obstime),
MLEWeibull(Data, [Rightcensor]), MOM(X, Data, Parameters),
NextCombination(Previous, size), NextPermutation(Previous), OrderStat(X, n, r, ["wo"]),
PlotDist(X, [low], [high]), PlotEmpCDF(Data, [low], [high]),
PlotEmpCIF(Data, [low], [high]), PlotEmpSF(Data, Censor),
PlotEmpVsFittedCDF(X, Data, Parameters, [low], [high]),
PlotEmpVsFittedCDF(X, Data, Parameters, [low], [high]),
PlotEmpVsFittedSF(X, Data, Parameters, Censor, low, high),
PPPlot(X, Data, Parameters), Product(X, Y), ProductIID(X, n),
QQPlot(X, Data, Parameters), RangeStat(X, n, ["wo"]), Skewness(X), Transform(X, g),
Truncate(X, low, high), Variance(X), VerifyPDF(X)

Procedure Notation:
X and Y are random variables
Greek letters are numeric or symbolic parameters
x is numeric or symbolic
n and r are positive integers, n >= r
low and high are numeric
g is a function
Brackets [] denote optional parameters
"double quotes" denote character strings
MATRIX is a 2 x 2 array of random variables
A capitalized parameter indicates that it must be
entered as a list --> ex. Data := [1, 12.4, 34, 52.45, 63]

Variate Generation:

ArcTanVariate(alpha, phi), BinomialVariate(n, p, m), ExponentialVariate(lambda),
NormalVariate(mu, sigma), UniformVariate(), WeibullVariate(lambda, kappa, m)

DATA SETS:

BallBearing, HorseKickFatalities, Hurricane, MP6, RatControl, RatTreatment, USSHalfBeak

ArcSinRV(), ArcTanRV(alpha, phi), BetaRV(alpha, beta), CauchyRV(a, alpha), ChiRV(n),

ChiSquareRV(n), ErlangRV(lambda, n), ErrorRV(mu, alpha, d), ExponentialRV(lambda), ExponentialPowerRV(lambda, kappa), ExtremeValueRV(alpha, beta), FRV(n1, n2), GammaRV(lambda, kappa), GeneralizedParetoRV(gamma, delta, kappa), GompertzRV(delta, kappa), HyperbolicSecantRV(), HyperExponentialRV(p, l), HypoExponentialRV(l), IDBRV(gamma, delta, kappa), InverseGaussianRV(lambda, mu), InvertedGammaRV(alpha, beta), KSRV(n), LaPlaceRV(omega, theta), LogGammaRV(alpha, beta), LogisticRV(kappa, lambda), LogLogisticRV(lambda, kappa), LogNormalRV(mu, sigma), LomaxRV(kappa, lambda), MakehamRV(gamma, delta, kappa), MuthRV(kappa), NormalRV(mu, sigma), ParetoRV(lambda, kappa), RayleighRV(lambda), StandardCauchyRV(), StandardNormalRV(), StandardTriangularRV(m), StandardUniformRV(), TRV(n), TriangularRV(a, m, b), UniformRV(a, b), WeibullRV(lambda, kappa)

```
Error, attempting to assign to `DataSets` which is protected.
Try declaring `local DataSets`; see ?protect for details.
```

```
> bf := GompertzRV(a,b);
  bfname := "GompertzRV(a,b)";
Originally a, renamed a~:
  is assumed to be: RealRange(Open(0),infinity)
```

$$bf := \left[\left[x \to a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}\right], [0, \infty], ["\text{Continuous}", "\text{PDF}"]\right]$$

$$bfname := "\text{GompertzRV(a,b)}" \qquad (1)$$

```
> #plot(1/csch(t)+1, t = 0..0.0010);
  #plot(diff(1/csch(t),t), t=0..0.0010);
  #limit(1/csch(t), t=0);
> solve(exp(-t) = y, t);
```

$$-\ln(y) \qquad (2)$$

```
> # discarded  -ln(t + 1),  t-> csch(t),t->arccsch(t),t -> tan(t),
> #name of the file for latex output
  filename := "C:/LatexOutput/GompertzGen.tex";


  glist := [t -> t^2 , t -> sqrt(t),  t -> 1/t,  t -> arctan(t),  t
  -> exp(t), t -> ln(t), t -> exp(-t), t -> -ln(t),  t -> ln(t+1),
  t -> 1/(ln(t+2)), t -> tanh(t), t -> sinh(t), t -> arcsinh(t),
  t-> csch(t+1),t->arccsch(t+1), t-> 1/tanh(t+1), t->  1/sinh(t+1),
   t->  1/arcsinh(t+1), t->  1/csch(t)+1, t-> tanh(1/t), t->csch
  (1/t), t-> arccsch(1/t), t-> arctanh(1/t)  ]:

  base := t -> PDF(bf, t):

  print(base(x)):

  #begin latex file formatting
  appendto(filename);
```

```
  printf("\\documentclass[12pt]{article} \n");
  printf("\\usepackage{amsfonts} \n");
  printf("\\begin{document} \n");
  print(bfname);
  printf("$$");
  latex(bf[1]);
  printf("$$");
writeto(terminal);

#begin loopint through transformations
for i from 1 to 22 do
#for i from 1 to 3 do
   print( "i is", i, "  ----------------------------------------
----------------------------------------------------------------
-------------");

   g := glist[i]:
   l := bf[2][1];
   u := bf[2][2];
   Temp := Transform(bf, [[unapply(g(x), x)],[l,u]]);

  #terminal output
  print( "l and u", l, u );
  print("g(x)", g(x), "base", base(x),bfname);
  print("f(x)", PDF(Temp, x));



  #latex output
  appendto(filename);
  printf("----------------------------------------------------------
-----------------------------------  \\\\");
  printf("$$");
  latex(glist[i]);
  printf("$$");
  printf("Probability Distribution Function \n$$  f(x)=");
  latex(PDF(Temp,x));
  printf("$$");



  writeto(terminal);


od;

#final latex output
appendto(filename);
printf("\\end{document}\n");
writeto(terminal);
```

$$filename := \text{"C:/LatexOutput/GompertzGen.tex"}$$

$$a\sim\, b\sim^{x} e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}$$

"i is", 1,

" ----------"

$$g := t \to t^2$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2} \; \frac{a\sim \, b\sim^{\sqrt{y\sim}} \, e^{-\frac{a\sim \left(b\sim^{\sqrt{y\sim}} - 1\right)}{\ln(b\sim)}}}{\sqrt{y\sim}} \right], [0, \infty], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", x^2, "base", $a\sim \, b\sim^{x} \, e^{-\frac{a\sim \left(b\sim^{x} - 1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $\frac{1}{2} \; \frac{a\sim \, b\sim^{\sqrt{x}} \, e^{-\frac{a\sim \left(b\sim^{\sqrt{x}} - 1\right)}{\ln(b\sim)}}}{\sqrt{x}}$

"i is", 2,

" ----------"

$$g := t \to \sqrt{t}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to 2 \; a\sim \, b\sim^{y\sim^2} \, e^{-\frac{a\sim \left(b\sim^{y\sim^2} - 1\right)}{\ln(b\sim)}} \; y\sim \right], [0, \infty], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", $\sqrt{x}$, "base", $a\sim \, b\sim^{x} \, e^{-\frac{a\sim \left(b\sim^{x} - 1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $2 \; a\sim \, b\sim^{x^2} \, e^{-\frac{a\sim \left(b\sim^{x^2} - 1\right)}{\ln(b\sim)}} \; x$

"i is", 3,

" ----------"

$$g := t \to \frac{1}{t}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim \, b\sim^{\frac{1}{y\sim}} \, e^{-\frac{a\sim \left(b\sim^{\frac{1}{y\sim}} - 1\right)}{\ln(b\sim)}}}{y\sim^2} \right], [0, \infty], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{x}$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $\frac{a\sim\, b\sim^{\frac{1}{x}}\, e^{-\frac{a\sim\,\left(b\sim^{\frac{1}{x}}-1\right)}{\ln(b\sim)}}}{x^{2}}$

"i is", 4,

" ----------"

$g := t \to \arctan(t)$

$l := 0$

$u := \infty$

$Temp := \left[\left[y\sim \to a\sim\, b\sim^{\tan(y\sim)}\, e^{-\frac{a\sim\,\left(b\sim^{\tan(y\sim)}-1\right)}{\ln(b\sim)}}\left(1+\tan(y\sim)^{2}\right)\right], \left[0, \frac{1}{2}\,\pi\right], \left["Continuous", "PDF"\right]\right]$

"l and u", 0, ∞

"g(x)", $\arctan(x)$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, b\sim^{\tan(x)}\, e^{-\frac{a\sim\,\left(b\sim^{\tan(x)}-1\right)}{\ln(b\sim)}}\left(1+\tan(x)^{2}\right)$

"i is", 5,

" ----------"

$g := t \to e^{t}$

$l := 0$

$u := \infty$

$Temp := \left[\left[y\sim \to a\sim\, y\sim^{\ln(b\sim)-1}\, e^{-\frac{a\sim\,\left(y\sim^{\ln(b\sim)}-1\right)}{\ln(b\sim)}}\right], \left[1, \infty\right], \left["Continuous", "PDF"\right]\right]$

"l and u", 0, ∞

"g(x)", e^{x}, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, x^{\ln(b\sim)-1}\, e^{-\frac{a\sim\,\left(x^{\ln(b\sim)}-1\right)}{\ln(b\sim)}}$

"i is", 6,

" ----------"

$g := t \to \ln(t)$

$l := 0$

$u := \infty$

$$Temp := \left[\left[y\sim \to a\sim\, b\sim^{e^{y\sim}}\, e^{-\frac{a\sim\, b\sim^{e^{y\sim}} - y\sim \ln(b\sim) - a\sim}{\ln(b\sim)}} \right], [-\infty, \infty], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", $\ln(x)$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, b\sim^{e^{x}}\, e^{-\frac{a\sim\, b\sim^{e^{x}} - x\ln(b\sim) - a\sim}{\ln(b\sim)}}$

"i is", 7,

" ----------"

$$g := t \to e^{-t}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to a\sim\, y\sim^{-\ln(b\sim)-1}\, e^{-\frac{a\sim\,(y\sim^{-\ln(b\sim)}-1)}{\ln(b\sim)}} \right], [0, 1], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", e^{-x}, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, x^{-\ln(b\sim)-1}\, e^{-\frac{a\sim\,(x^{-\ln(b\sim)}-1)}{\ln(b\sim)}}$

"i is", 8,

" ----------"

$$g := t \to -\ln(t)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to a\sim\, b\sim^{e^{-y\sim}}\, e^{-\frac{a\sim\, b\sim^{e^{-y\sim}} + y\sim \ln(b\sim) - a\sim}{\ln(b\sim)}} \right], [-\infty, \infty], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", $-\ln(x)$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, b\sim^{e^{-x}}\, e^{-\frac{a\sim\, b\sim^{e^{-x}} + x\ln(b\sim) - a\sim}{\ln(b\sim)}}$

"i is", 9,

" ----------"

$$g := t \to \ln(t+1)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to a\sim\, b\sim^{e^{y\sim}-1}\, e^{-\frac{a\sim\, b\sim^{e^{y\sim}-1}-y\sim \ln(b\sim)-a\sim}{\ln(b\sim)}}\right], [0,\ \infty], ["Continuous", "PDF"]\right]$$

"l and u", 0, ∞

"g(x)", $\ln(x+1)$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, b\sim^{e^{x}-1}\, e^{-\frac{a\sim\, b\sim^{e^{x}-1}-x\ln(b\sim)-a\sim}{\ln(b\sim)}}$

"i is", 10,

" ----------"

$$g := t \to \frac{1}{\ln(t+2)}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{e^{\frac{1}{y\sim}}-2}\, e^{-\frac{a\sim y\sim b\sim^{e^{\frac{1}{y\sim}}}-2-a\sim y\sim-\ln(b\sim)}{\ln(b\sim)\, y\sim}}}{y\sim^{2}}\right], \left[0,\ \frac{1}{\ln(2)}\right], ["Continuous", "PDF"]\right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\ln(x+2)}$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,(b\sim^{x}-1)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $\frac{a\sim\, b\sim^{e^{\frac{1}{x}}-2}\, e^{-\frac{a\sim x b\sim^{e^{\frac{1}{x}}}-2-a\sim x-\ln(b\sim)}{\ln(b\sim)\, x}}}{x^{2}}$

"i is", 11,

" ----------"

$$g := t \to \tanh(t)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to -\frac{a\sim\, b\sim^{\operatorname{arctanh}(y\sim)}\, e^{-\frac{a\sim\,(b\sim^{\operatorname{arctanh}(y\sim)}-1)}{\ln(b\sim)}}}{y\sim^{2}-1}\right], [0, 1], ["Continuous", "PDF"]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"},\ \tanh(x),\ \text{"base"},\ a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}},\ \text{"GompertzRV(a,b)"}$$

$$\text{"f(x)"},\ -\frac{a\sim\, b\sim^{\operatorname{arctanh}(x)}\, e^{-\frac{a\sim\,\left(b\sim^{\operatorname{arctanh}(x)}-1\right)}{\ln(b\sim)}}}{x^2-1}$$

"i is", 12,

" ----------"

$$g := t\to\sinh(t)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to\frac{a\sim\, b\sim^{\operatorname{arcsinh}(y\sim)}\, e^{-\frac{a\sim\,\left(b\sim^{\operatorname{arcsinh}(y\sim)}-1\right)}{\ln(b\sim)}}}{\sqrt{y\sim^2+1}}\right],\ [0,\ \infty],\ [\text{"Continuous"},\ \text{"PDF"}]\right]$$

$$\text{"l and u"},\ 0,\ \infty$$

$$\text{"g(x)"},\ \sinh(x),\ \text{"base"},\ a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}},\ \text{"GompertzRV(a,b)"}$$

$$\text{"f(x)"},\ \frac{a\sim\, b\sim^{\operatorname{arcsinh}(x)}\, e^{-\frac{a\sim\,\left(b\sim^{\operatorname{arcsinh}(x)}-1\right)}{\ln(b\sim)}}}{\sqrt{x^2+1}}$$

"i is", 13,

" ----------"

$$g := t\to\operatorname{arcsinh}(t)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to a\sim\, b\sim^{\sinh(y\sim)}\, e^{-\frac{a\sim\,\left(b\sim^{\sinh(y\sim)}-1\right)}{\ln(b\sim)}}\,\cosh(y\sim)\right],\ [0,\ \infty],\ [\text{"Continuous"},\ \text{"PDF"}]\right]$$

$$\text{"l and u"},\ 0,\ \infty$$

$$\text{"g(x)"},\ \operatorname{arcsinh}(x),\ \text{"base"},\ a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}},\ \text{"GompertzRV(a,b)"}$$

$$\text{"f(x)"},\ a\sim\, b\sim^{\sinh(x)}\, e^{-\frac{a\sim\,\left(b\sim^{\sinh(x)}-1\right)}{\ln(b\sim)}}\,\cosh(x)$$

"i is", 14,

" ----------"

$$g := t\to\operatorname{csch}(t+1)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{-1+\operatorname{arccsch}(y\sim)}\, e^{-\frac{a\sim\,\left(b\sim^{-1+\operatorname{arccsch}(y\sim)}-1\right)}{\ln(b\sim)}}}{\sqrt{y\sim^2+1}\;\lvert y\sim\rvert} \right], \left[0, \frac{2}{e-e^{-1}}\right], \right.$$

$$\left. \left["Continuous", "PDF"]\right] \right]$$

$$"l \text{ and } u", 0, \infty$$

$$"g(x)", \operatorname{csch}(x+1), "base", a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}}, "GompertzRV(a,b)"$$

$$"f(x)", \frac{a\sim\, b\sim^{-1+\operatorname{arccsch}(x)}\, e^{-\frac{a\sim\,\left(b\sim^{-1+\operatorname{arccsch}(x)}-1\right)}{\ln(b\sim)}}}{\sqrt{x^2+1}\;\lvert x\rvert}$$

"i is", 15,

" ----------"

$$g := t\to \operatorname{arccsch}(t+1)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{-\frac{\sinh(y\sim)-1}{\sinh(y\sim)}}\, e^{-\frac{a\sim\,\left(b\sim^{-\frac{\sinh(y\sim)-1}{\sinh(y\sim)}}-1\right)}{\ln(b\sim)}}\cosh(y\sim)}{\sinh(y\sim)^2} \right], \left[0, \ln\left(1+\sqrt{2}\right)\right], \right.$$

$$\left. \left["Continuous", "PDF"]\right] \right]$$

$$"l \text{ and } u", 0, \infty$$

$$"g(x)", \operatorname{arccsch}(x+1), "base", a\sim\, b\sim^{x}\, e^{-\frac{a\sim\,\left(b\sim^{x}-1\right)}{\ln(b\sim)}}, "GompertzRV(a,b)"$$

$$"f(x)", \frac{a\sim\, b\sim^{-\frac{\sinh(x)-1}{\sinh(x)}}\, e^{-\frac{a\sim\,\left(b\sim^{-\frac{\sinh(x)-1}{\sinh(x)}}-1\right)}{\ln(b\sim)}}\cosh(x)}{\sinh(x)^2}$$

"i is", 16,

" ----------"

$$g := t\to \frac{1}{\tanh(t+1)}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{-1+\operatorname{arctanh}\left(\frac{1}{y\sim}\right)}\, e^{-\frac{a\sim\left(b\sim^{-1+\operatorname{arctanh}\left(\frac{1}{y\sim}\right)}-1\right)}{\ln(b\sim)}}}{y\sim^2-1} \right], \left[1, \frac{e+e^{-1}}{e-e^{-1}}\right], \right.$$

$$\left. ["Continuous", "PDF"] \right]$$

$$"l \text{ and } u", 0, \infty$$

$$"g(x)", \frac{1}{\tanh(x+1)}, "base", a\sim\, b\sim^x\, e^{-\frac{a\sim\left(b\sim^x-1\right)}{\ln(b\sim)}}, "GompertzRV(a,b)"$$

$$"f(x)", \frac{a\sim\, b\sim^{-1+\operatorname{arctanh}\left(\frac{1}{x}\right)}\, e^{-\frac{a\sim\left(b\sim^{-1+\operatorname{arctanh}\left(\frac{1}{x}\right)}-1\right)}{\ln(b\sim)}}}{x^2-1}$$

"i is", 17,

" ----------"

$$g := t \to \frac{1}{\sinh(t+1)}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)}\, e^{-\frac{a\sim\left(b\sim^{-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)}-1\right)}{\ln(b\sim)}}}{\sqrt{y\sim^2+1}\ |y\sim|} \right], \left[0, \frac{2}{e-e^{-1}}\right], \right.$$

$$\left. ["Continuous", "PDF"] \right]$$

$$"l \text{ and } u", 0, \infty$$

$$"g(x)", \frac{1}{\sinh(x+1)}, "base", a\sim\, b\sim^x\, e^{-\frac{a\sim\left(b\sim^x-1\right)}{\ln(b\sim)}}, "GompertzRV(a,b)"$$

$$"f(x)", \frac{a\sim\, b\sim^{-1+\operatorname{arcsinh}\left(\frac{1}{x}\right)}\, e^{-\frac{a\sim\left(b\sim^{-1+\operatorname{arcsinh}\left(\frac{1}{x}\right)}-1\right)}{\ln(b\sim)}}}{\sqrt{x^2+1}\ |x|}$$

"i is", 18,

" ----------"

$$g := t \to \frac{1}{\operatorname{arcsinh}(t+1)}$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{-1+\sinh\left(\frac{1}{y\sim}\right)}\, e^{-\frac{a\sim\left(b\sim^{-1+\sinh\left(\frac{1}{y\sim}\right)}-1\right)}{\ln(b\sim)}}\, \cosh\left(\frac{1}{y\sim}\right)}{y\sim^2} \right], \left[0, \frac{1}{\ln\left(1+\sqrt{2}\right)} \right], \left[\text{"Continuous"}, \text{"PDF"} \right] \right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\operatorname{arcsinh}(x+1)}$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\left(b\sim^{x}-1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $\frac{a\sim\, b\sim^{-1+\sinh\left(\frac{1}{x}\right)}\, e^{-\frac{a\sim\left(b\sim^{-1+\sinh\left(\frac{1}{x}\right)}-1\right)}{\ln(b\sim)}}\, \cosh\left(\frac{1}{x}\right)}{x^2}$

"i is", 19,

" ----------"

$$g := t \to \frac{1}{\operatorname{csch}(t)} + 1$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{a\sim\, b\sim^{\operatorname{arccsch}\left(\frac{1}{y\sim-1}\right)}\, e^{-\frac{a\sim\left(b\sim^{\operatorname{arccsch}\left(\frac{1}{y\sim-1}\right)}-1\right)}{\ln(b\sim)}}}{\sqrt{y\sim^2-2\,y\sim+2}} \right], [1, \infty], [\text{"Continuous"}, \text{"PDF"}] \right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\operatorname{csch}(x)} + 1$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\left(b\sim^{x}-1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

$$\text{"f(x)"},\ \frac{a\sim\, b\sim^{\operatorname{arccsch}\left(\frac{1}{x-1}\right)}\, e^{-\frac{a\sim\left(b\sim^{\operatorname{arccsch}\left(\frac{1}{x-1}\right)}-1\right)}{\ln(b\sim)}}}{\sqrt{x^2-2x+2}}$$

"i is", 20,

" ----------"

$$g := t\to\tanh\left(\frac{1}{t}\right)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to -\frac{a\sim\, b\sim^{\frac{1}{\operatorname{arctanh}(y\sim)}}\, e^{-\frac{a\sim\left(b\sim^{\frac{1}{\operatorname{arctanh}(y\sim)}}-1\right)}{\ln(b\sim)}}}{\operatorname{arctanh}(y\sim)^2\left(y\sim^2-1\right)}\right],\ [0,\ 1],\ [\text{"Continuous"},\ \text{"PDF"}]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"},\ \tanh\left(\frac{1}{x}\right),\ \text{"base"},\ a\sim\, b\sim^{x}\, e^{-\frac{a\sim\left(b\sim^{x}-1\right)}{\ln(b\sim)}},\ \text{"GompertzRV(a,b)"}$$

$$\text{"f(x)"},\ -\frac{a\sim\, b\sim^{\frac{1}{\operatorname{arctanh}(x)}}\, e^{-\frac{a\sim\left(b\sim^{\frac{1}{\operatorname{arctanh}(x)}}-1\right)}{\ln(b\sim)}}}{\operatorname{arctanh}(x)^2\left(x^2-1\right)}$$

"i is", 21,

" ----------"

$$g := t\to\operatorname{csch}\left(\frac{1}{t}\right)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to\frac{a\sim\, b\sim^{\frac{1}{\operatorname{arccsch}(y\sim)}}\, e^{-\frac{a\sim\left(b\sim^{\frac{1}{\operatorname{arccsch}(y\sim)}}-1\right)}{\ln(b\sim)}}}{\sqrt{y\sim^2+1}\ \operatorname{arccsch}(y\sim)^2\,|y\sim|}\right],\ [0,\ \infty],\ [\text{"Continuous"},\ \text{"PDF"}]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"},\ \operatorname{csch}\left(\frac{1}{x}\right),\ \text{"base"},\ a\sim\, b\sim^{x}\, e^{-\frac{a\sim\left(b\sim^{x}-1\right)}{\ln(b\sim)}},\ \text{"GompertzRV(a,b)"}$$

$$\text{"f(x)"},\ \frac{a\sim\, b\sim^{\frac{1}{\operatorname{arccsch}(x)}}\, e^{-\frac{a\sim\left(b\sim^{\frac{1}{\operatorname{arccsch}(x)}}-1\right)}{\ln(b\sim)}}}{\sqrt{x^2+1}\ \operatorname{arccsch}(x)^2\,|x|}$$

"i is", 22,

" ----------
----------"

$$g := t \to \operatorname{arccsch}\left(\frac{1}{t}\right)$$

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to a\sim\, b\sim^{\sinh(y\sim)}\, e^{-\frac{a\sim\left(b\sim^{\sinh(y\sim)}-1\right)}{\ln(b\sim)}}\cosh(y\sim)\right], [0,\ \infty], ["\text{Continuous}", "\text{PDF}"]\right]$$

"l and u", 0, ∞

"g(x)", $\operatorname{arccsch}\left(\frac{1}{x}\right)$, "base", $a\sim\, b\sim^{x}\, e^{-\frac{a\sim\left(b\sim^{x}-1\right)}{\ln(b\sim)}}$, "GompertzRV(a,b)"

"f(x)", $a\sim\, b\sim^{\sinh(x)}\, e^{-\frac{a\sim\left(b\sim^{\sinh(x)}-1\right)}{\ln(b\sim)}}\cosh(x)$ **(3)**