```
> 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 := HypoExponentialRV([a,b,c]);
  bfname := "HypoExponentialRV([a,b,c])";
Originally a, renamed a~:
  is assumed to be: RealRange(Open(0),infinity)

Originally b, renamed b~:
  is assumed to be: RealRange(Open(0),infinity)

Originally c, renamed c~:
  is assumed to be: RealRange(Open(0),infinity)
```

$$bf := \left[\left[z\sim \rightarrow \frac{c\sim b\sim a\sim \left(e^{-c\sim z\sim} a\sim - e^{-c\sim z\sim} b\sim + e^{-a\sim z\sim} b\sim - e^{-a\sim z\sim} c\sim - e^{-b\sim z\sim} a\sim + e^{-b\sim z\sim} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)}\right],\ [0,\ \infty],\ [\text{"Continuous"},\ \text{"PDF"}]\right]$$

$$bfname := \text{"HypoExponentialRV([a,b,c])"} \quad \textbf{(1)}$$

```
> #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);
```

$$-\ln(y) \quad \textbf{(2)}$$

```
> # discarded  -ln(t + 1),  t-> csch(t),t->arccsch(t),t -> tan(t),
> #name of the file for latex output
  filename := "C:/LatexOutput/General_Modified/HypoExponential_Gen.
  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$$  f(x)=");
  latex(PDF(Temp,x));
  printf(" \\qquad");
  latex(Temp[2][1]);
  printf(" < x < ");
  latex(Temp[2][2]);
  printf("$$");
```

```
    writeto(terminal);


  od;

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

$$filename := \text{"C:/LatexOutput/General\_Modified/HypoExponential\_Gen.tex"}$$

$$\frac{c\sim\, b\sim\, a\sim\, \left(e^{-c\sim\, x}\, a\sim - e^{-c\sim\, x}\, b\sim + e^{-a\sim\, x}\, b\sim - e^{-a\sim\, x}\, c\sim - e^{-b\sim\, x}\, a\sim + e^{-b\sim\, x}\, c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)}$$

"i is", 1,

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

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

$$l := 0$$

$$u := \infty$$

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

$$\left.[\text{"Continuous"}, \text{"PDF"}]\right]$$

"l and u", 0, ∞

"g(x)", x^2, "base",

$$\frac{c\sim\, b\sim\, a\sim\, \left(e^{-c\sim\, x}\, a\sim - e^{-c\sim\, x}\, b\sim + e^{-a\sim\, x}\, b\sim - e^{-a\sim\, x}\, c\sim - e^{-b\sim\, x}\, a\sim + e^{-b\sim\, x}\, c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

"f(x)",

$$\frac{1}{2}\ \frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)\ \sqrt{x}}\left(c\sim\, b\sim\, a\sim\, \left(e^{-c\sim\sqrt{x}}\, a\sim - e^{-c\sim\sqrt{x}}\, b\sim + e^{-a\sim\sqrt{x}}\, b\sim - e^{-a\sim\sqrt{x}}\, c\sim - e^{-b\sim\sqrt{x}}\, a\sim + e^{-b\sim\sqrt{x}}\, c\sim\right)\right)$$

"i is", 2,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\right.\right.$$

$$\to \frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)} \left(2\ c\sim b\sim a\sim \left(e^{-c\sim y\sim^2}\ a\sim - e^{-c\sim y\sim^2}\ b\sim + e^{-a\sim y\sim^2}\ b\sim - e^{-a\sim y\sim^2}\ c\sim - e^{-b\sim y\sim^2}\ a\sim + e^{-b\sim y\sim^2}\ c\sim\right) y\sim\right)\Bigg], [0,\ \infty], ["Continuous", "PDF"]\Bigg]$$

"l and u", 0, ∞

"g(x)", $\sqrt{x}$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x}\ a\sim - e^{-c\sim x}\ b\sim + e^{-a\sim x}\ b\sim - e^{-a\sim x}\ c\sim - e^{-b\sim x}\ a\sim + e^{-b\sim x}\ c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 3,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\frac{1}{x}$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x}\ a\sim - e^{-c\sim x}\ b\sim + e^{-a\sim x}\ b\sim - e^{-a\sim x}\ c\sim - e^{-b\sim x}\ a\sim + e^{-b\sim x}\ c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 4,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\arctan(x)$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x}\ a\sim - e^{-c\sim x}\ b\sim + e^{-a\sim x}\ b\sim - e^{-a\sim x}\ c\sim - e^{-b\sim x}\ a\sim + e^{-b\sim x}\ c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 5,

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

$$g := t \to e^t$$
$$l := 0$$
$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", e^x, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x}\ a\sim - e^{-c\sim x}\ b\sim + e^{-a\sim x}\ b\sim - e^{-a\sim x}\ c\sim - e^{-b\sim x}\ a\sim + e^{-b\sim x}\ c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

"f(x)", $\frac{c\sim b\sim a\sim \left(x^{-c\sim}\ a\sim - x^{-c\sim}\ b\sim + x^{-a\sim}\ b\sim - x^{-a\sim}\ c\sim - x^{-b\sim}\ a\sim + x^{-b\sim}\ c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)\ x}$

"i is", 6,

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

$$g := t \to \ln(t)$$
$$l := 0$$
$$u := \infty$$

$$Temp := \left[\left[y\sim\right.\right.$$

$$\rightarrow \frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)} \left(c\sim b\sim a\sim \left(e^{-c\sim e^{y\sim}} a\sim - e^{-c\sim e^{y\sim}} b\sim + e^{-a\sim e^{y\sim}} b\sim - e^{-a\sim e^{y\sim}} c\sim - e^{-b\sim e^{y\sim}} a\sim + e^{-b\sim e^{y\sim}} c\sim\right) e^{y\sim}\right)\Big], [-\infty, \infty], ["Continuous", "PDF"]\Big]$$

"l and u", 0, ∞

"g(x)", $\ln(x)$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 7,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \Big[\Big[y\sim \rightarrow \frac{c\sim b\sim a\sim \left(y\sim^{c\sim} a\sim - y\sim^{c\sim} b\sim + y\sim^{a\sim} b\sim - y\sim^{a\sim} c\sim - y\sim^{b\sim} a\sim + y\sim^{b\sim} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)\ y\sim}\Big], [0, 1], ["Continuous", "PDF"]\Big]$$

"l and u", 0, ∞

"g(x)", e^{-x}, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

"f(x)", $\frac{c\sim b\sim a\sim \left(x^{c\sim} a\sim - x^{c\sim} b\sim + x^{a\sim} b\sim - x^{a\sim} c\sim - x^{b\sim} a\sim + x^{b\sim} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)\ x}$

"i is", 8,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $-\ln(x)$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

"f(x)",

$$\frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)} \left(c\sim b\sim a\sim \left(e^{-c\sim e^{-x}} a\sim - e^{-c\sim e^{-x}} b\sim + e^{-a\sim e^{-x}} b\sim - e^{-a\sim e^{-x}} c\sim - e^{-b\sim e^{-x}} a\sim + e^{-b\sim e^{-x}} c\sim\right) e^{-x}\right)$$

"i is", 9,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)} \left(c\sim b\sim a\sim \left(e^{-c\sim \left(e^{y\sim} - 1\right)} a\sim - e^{-c\sim \left(e^{y\sim} - 1\right)} b\sim + e^{-a\sim \left(e^{y\sim} - 1\right)} b\sim - e^{-a\sim \left(e^{y\sim} - 1\right)} c\sim - e^{-b\sim \left(e^{y\sim} - 1\right)} a\sim + e^{-b\sim \left(e^{y\sim} - 1\right)} c\sim\right) e^{y\sim}\right)\right], [0, \infty], \right.$$

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

"l and u", 0, ∞

"g(x)", $\ln(x+1)$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 10,

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

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

$$l := 0$$

$$u := \infty$$

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

$$+ e^{-b\sim\left(e^{\frac{1}{y\sim}}-2\right)} c\sim\Big)\, e^{\frac{1}{y\sim}}\Big)\Big], \left[0,\ \frac{1}{\ln(2)}\right], \left["\text{Continuous}", "\text{PDF}"\right]\Big]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\ln(x+2)}$, "base",

$$\frac{c\sim b\sim a\sim\left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

$$+ e^{-a\sim\left(e^{\frac{1}{x}}-2\right)} b\sim - e^{-a\sim\left(e^{\frac{1}{x}}-2\right)} c\sim - e^{-b\sim\left(e^{\frac{1}{x}}-2\right)} a\sim + e^{-b\sim\left(e^{\frac{1}{x}}-2\right)} c\sim\Big)\, e^{\frac{1}{x}}\Big)$$

"i is", 11,

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

$$g := t \to \tanh(t)$$
$$l := 0$$
$$u := \infty$$

$$Temp := \Big[\Big[y\sim \to -\frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)\ \left(y\sim^2 - 1\right)}\Big(c\sim b\sim a\sim\Big(e^{-c\sim \operatorname{arctanh}(y\sim)} a\sim$$

$$- e^{-c\sim \operatorname{arctanh}(y\sim)} b\sim + e^{-a\sim \operatorname{arctanh}(y\sim)} b\sim - e^{-a\sim \operatorname{arctanh}(y\sim)} c\sim - e^{-b\sim \operatorname{arctanh}(y\sim)} a\sim$$

$$+ e^{-b\sim \operatorname{arctanh}(y\sim)} c\sim\Big)\Big)\Big], [0, 1], ["\text{Continuous}", "\text{PDF}"]\Big]$$

"l and u", 0, ∞

"g(x)", $\tanh(x)$, "base",

$$\frac{c\sim b\sim a\sim\left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

$$- e^{-c\sim \operatorname{arctanh}(x)} b\sim + e^{-a\sim \operatorname{arctanh}(x)} b\sim - e^{-a\sim \operatorname{arctanh}(x)} c\sim - e^{-b\sim \operatorname{arctanh}(x)} a\sim$$

$$+ e^{-b\sim \operatorname{arctanh}(x)} c\sim\Big)\Big)$$

"i is", 12,

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

$$g := t \to \sinh(t)$$
$$l := 0$$
$$u := \infty$$

$$Temp := \Big[\Big[y\sim \to \frac{1}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)\ \sqrt{y\sim^2 + 1}}\Big(c\sim b\sim a\sim\Big(e^{-c\sim \operatorname{arcsinh}(y\sim)} a\sim$$

$$-e^{-c\sim \operatorname{arcsinh}(y\sim)}\, b\sim + e^{-a\sim \operatorname{arcsinh}(y\sim)}\, b\sim - e^{-a\sim \operatorname{arcsinh}(y\sim)}\, c\sim - e^{-b\sim \operatorname{arcsinh}(y\sim)}\, a\sim + e^{-b\sim \operatorname{arcsinh}(y\sim)}\, c\sim)\,)\,],\ [0,\ \infty\,],\ [\text{"Continuous"},\ \text{"PDF"}]]$$

"l and u", 0, ∞

"g(x)", $\sinh(x)$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x}\, a\sim - e^{-c\sim x}\, b\sim + e^{-a\sim x}\, b\sim - e^{-a\sim x}\, c\sim - e^{-b\sim x}\, a\sim + e^{-b\sim x}\, c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 13,

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

$$g := t \to \operatorname{arcsinh}(t)$$
$$l := 0$$
$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\operatorname{arcsinh}(x)$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x}\, a\sim - e^{-c\sim x}\, b\sim + e^{-a\sim x}\, b\sim - e^{-a\sim x}\, c\sim - e^{-b\sim x}\, a\sim + e^{-b\sim x}\, c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 14,

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

$$g := t \to \operatorname{csch}(t+1)$$
$$l := 0$$
$$u := \infty$$

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

$$-e^{-c\sim(-1+\operatorname{arccsch}(y\sim))}\,b\sim+e^{-a\sim(-1+\operatorname{arccsch}(y\sim))}\,b\sim-e^{-a\sim(-1+\operatorname{arccsch}(y\sim))}\,c\sim$$

$$-e^{-b\sim(-1+\operatorname{arccsch}(y\sim))}\,a\sim+e^{-b\sim(-1+\operatorname{arccsch}(y\sim))}\,c\sim)\,)\,],\left[0,\frac{2}{e-e^{-1}}\right],[\text{"Continuous"},$$

"PDF"]]

"l and u", 0, ∞

"g(x)", $\operatorname{csch}(x+1)$, "base",

$$\frac{c\sim b\sim a\sim\left(e^{-c\sim x}a\sim-e^{-c\sim x}b\sim+e^{-a\sim x}b\sim-e^{-a\sim x}c\sim-e^{-b\sim x}a\sim+e^{-b\sim x}c\sim\right)}{(a\sim-b\sim)\,(a\sim-c\sim)\,(b\sim-c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

$-e^{-c\sim(-1+\operatorname{arccsch}(x))}\,b\sim+e^{-a\sim(-1+\operatorname{arccsch}(x))}\,b\sim-e^{-a\sim(-1+\operatorname{arccsch}(x))}\,c\sim$

$\left.\left.-e^{-b\sim(-1+\operatorname{arccsch}(x))}\,a\sim+e^{-b\sim(-1+\operatorname{arccsch}(x))}\,c\sim\right)\right)$

"i is", 15,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to\frac{1}{(a\sim-b\sim)\,(a\sim-c\sim)\,(b\sim-c\sim)\,\sinh(y\sim)^2}\left(c\sim b\sim a\sim\left(e^{\frac{c\sim(\sinh(y\sim)-1)}{\sinh(y\sim)}}\,a\sim\right.\right.\right.$$

$$-e^{\frac{c\sim(\sinh(y\sim)-1)}{\sinh(y\sim)}}\,b\sim+e^{\frac{a\sim(\sinh(y\sim)-1)}{\sinh(y\sim)}}\,b\sim-e^{\frac{a\sim(\sinh(y\sim)-1)}{\sinh(y\sim)}}\,c\sim-e^{\frac{b\sim(\sinh(y\sim)-1)}{\sinh(y\sim)}}\,a\sim$$

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

"l and u", 0, ∞

"g(x)", $\operatorname{arccsch}(x+1)$, "base",

$$\frac{c\sim b\sim a\sim\left(e^{-c\sim x}a\sim-e^{-c\sim x}b\sim+e^{-a\sim x}b\sim-e^{-a\sim x}c\sim-e^{-b\sim x}a\sim+e^{-b\sim x}c\sim\right)}{(a\sim-b\sim)\,(a\sim-c\sim)\,(b\sim-c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

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

$\left.\left.+e^{\frac{b\sim(\sinh(x)-1)}{\sinh(x)}}\,c\sim\right)\cosh(x)\right)$

"i is", 16,

" ----------

----------"

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\frac{1}{\tanh(x+1)}$, "base",

$$\frac{c\sim\, b\sim\, a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\,(a\sim - c\sim)\,(b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 17,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \right.\right.$$

$$\to \frac{1}{\sqrt{y\sim^2+1}\ (a\sim-b\sim)\ (a\sim-c\sim)\ (b\sim-c\sim)\ |y\sim|}\left(c\sim b\sim a\sim\left(e^{-c\sim\left(-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)\right)}a\sim - e^{-c\sim\left(-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)\right)}b\sim + e^{-a\sim\left(-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)\right)}b\sim - e^{-a\sim\left(-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)\right)}c\sim - e^{-b\sim\left(-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)\right)}a\sim + e^{-b\sim\left(-1+\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)\right)}c\sim\right)\right)\Bigg], \left[0, \frac{2}{e-e^{-1}}\right], [\text{"Continuous"}, \text{"PDF"}]\Bigg]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\sinh(x+1)}$, "base",

$$\frac{c\sim b\sim a\sim\left(e^{-c\sim x}a\sim - e^{-c\sim x}b\sim + e^{-a\sim x}b\sim - e^{-a\sim x}c\sim - e^{-b\sim x}a\sim + e^{-b\sim x}c\sim\right)}{(a\sim-b\sim)\ (a\sim-c\sim)\ (b\sim-c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 18,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\frac{1}{\operatorname{arcsinh}(x+1)}$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 19,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\frac{1}{\operatorname{csch}(x)} + 1$, "base",

$$\frac{c\sim b\sim a\sim \left(e^{-c\sim x} a\sim - e^{-c\sim x} b\sim + e^{-a\sim x} b\sim - e^{-a\sim x} c\sim - e^{-b\sim x} a\sim + e^{-b\sim x} c\sim\right)}{(a\sim - b\sim)\ (a\sim - c\sim)\ (b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 20,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\tanh\left(\frac{1}{x}\right)$, "base",

$$\frac{c\sim\, b\sim\, a\sim \left(e^{-c\sim x}\, a\sim - e^{-c\sim x}\, b\sim + e^{-a\sim x}\, b\sim - e^{-a\sim x}\, c\sim - e^{-b\sim x}\, a\sim + e^{-b\sim x}\, c\sim\right)}{(a\sim - b\sim)\,(a\sim - c\sim)\,(b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

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

"i is", 21,

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

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

$$l := 0$$

$$u := \infty$$

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

"l and u", 0, ∞

"g(x)", $\operatorname{csch}\left(\frac{1}{x}\right)$, "base",

$$\frac{c\sim\, b\sim\, a\sim \left(e^{-c\sim x}\, a\sim - e^{-c\sim x}\, b\sim + e^{-a\sim x}\, b\sim - e^{-a\sim x}\, c\sim - e^{-b\sim x}\, a\sim + e^{-b\sim x}\, c\sim\right)}{(a\sim - b\sim)\,(a\sim - c\sim)\,(b\sim - c\sim)},$$

"HypoExponentialRV([a,b,c])"

"f(x)", $\left(c\sim\, b\sim\, a\sim \left(e^{-\frac{c\sim}{\operatorname{arccsch}(x)}}\, a\sim - e^{-\frac{c\sim}{\operatorname{arccsch}(x)}}\, b\sim + e^{-\frac{a\sim}{\operatorname{arccsch}(x)}}\, b\sim - e^{-\frac{a\sim}{\operatorname{arccsch}(x)}}\, c\sim\right.\right.$

$$-e^{-\frac{b\sim}{\operatorname{arccsch}(x)}}\,a\sim+e^{-\frac{b\sim}{\operatorname{arccsch}(x)}}\,c\sim\Big)\Big)\Big/\Big(\sqrt{x^2+1}\;(a\sim-b\sim)\;(a\sim-c\sim)\;(b\sim-c\sim)\;\operatorname{arccsch}(x)^2\,|x|\Big)$$

"i is", 22,

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

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

$$l:=0$$

$$u:=\infty$$

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

$$\left.["\text{Continuous}","\text{PDF}"]\right]$$

"l and u", 0, ∞

"g(x)", $\operatorname{arccsch}\left(\frac{1}{x}\right)$, "base",

$$\frac{c\sim b\sim a\sim\left(e^{-c\sim x}\,a\sim-e^{-c\sim x}\,b\sim+e^{-a\sim x}\,b\sim-e^{-a\sim x}\,c\sim-e^{-b\sim x}\,a\sim+e^{-b\sim x}\,c\sim\right)}{(a\sim-b\sim)\;(a\sim-c\sim)\;(b\sim-c\sim)},$$

"HypoExponentialRV([a,b,c])"

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