```
> 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 := HyperExponentialRV([1/2,1/2],[3,4]);
  bfname := "HyperExponentialRV([1/2,1/2],[3,4])";
```

$$bf := \left[\left[x \to \frac{3}{2}\, e^{-3x} + 2\, e^{-4x}\right], [0, \infty], ["\text{Continuous}", "\text{PDF}"]\right]$$

$$bfname := \text{"HyperExponentialRV([1/2,1/2],[3,4])"} \quad \textbf{(1)}$$

```
> #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/HyperExponential.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));
  print("F(x)", CDF(Temp, x));
  if i <> 14 and i <> 15  and i <> 16 and i <> 21 then
  print("IDF(x)", IDF(Temp));
  end if;
  print("S(x)", SF(Temp, x));
  print("h(x)", HF(Temp, x));
  if i <> 18 then
  print("mean and variance", Mean(Temp), Variance(Temp));
  assume(r > 0); mf := int(x^r*PDF(Temp, x), x = Temp[2][1] ..
Temp[2][2]):
  print("MF", mf);
  print("MGF", MGF(Temp));
  # if statements do not work with PlotDist yet
  PlotDist(PDF(Temp), 0, 40);
  PlotDist(HF(Temp), 0, 40);
  latex(PDF(Temp,x));
  #print("transforming with", [[x->g(x)],[0,infinity]]);
  #X2 := Transform(bf, [[x->g(x)],[0,infinity]]);
  #print("pdf of X2 = ", PDF(X2,x));
  #print("pdf of Temp = ", PDF(Temp,x));
  end if;


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

```
    printf(" Inverse Cumulative Distribution Function \n ");
    printf(" $$F^{-1} = ");
    if i <> 14 and i <> 15 and i <> 16 and i <> 21 then
    latex(IDF(Temp)[1]);
    end if;
    printf("$$");
    printf("Survivor Function \n $$ S(x)=");
    latex(SF(Temp, x));
    printf("$$ Hazard Function \n $$ h(x)=");
    latex(HF(Temp,x));
    printf("$$");
    if i <> 18 then
    printf("Mean \n $$ \\mu=");
    latex(Mean(Temp));
    printf("$$ Variance \n $$ \\sigma^2 = ");
    latex(Variance(Temp));
    printf("$$");
    printf("Moment Function \n $$ m(x) = ");
    latex(mf);
    printf("$$ Moment Generating Function \n $$");
    latex(MGF(Temp)[1]);
    printf("$$");
    #latex(MGF(Temp)[1]);
    end if;

    writeto(terminal);


  od;

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

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

$$\frac{3}{2}\, e^{-3x} + 2\, e^{-4x}$$

"i is", 1,
" ----------"

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{4}\, \frac{e^{-3\sqrt{y\sim}}\left(4\, e^{-\sqrt{y\sim}} + 3\right)}{\sqrt{y\sim}}\right], [0, \infty], ["Continuous", "PDF"]\right]$$

"l and u", 0, ∞

"g(x)", x^2, "base", $\frac{3}{2}\, e^{-3x} + 2\, e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

$$\text{"f(x)"}, \frac{1}{4}\ \frac{e^{-3\sqrt{x}}\left(4\,e^{-\sqrt{x}}+3\right)}{\sqrt{x}}$$

$$\text{"F(x)"}, \frac{1}{2}\left(2\,e^{4\sqrt{x}}-e^{\sqrt{x}}-1\right)e^{-4\sqrt{x}}$$

$$\text{"IDF(x)"}, \left[\left[s\to \ln\left(RootOf\left(1+(2\,s-2)\,\_Z^4+\_Z\right)\right)^2\right], [0,1], [\text{"Continuous"}, \text{"IDF"}]\right]$$

$$\text{"S(x)"}, \frac{1}{2}\,e^{-3\sqrt{x}}+\frac{1}{2}\,e^{-4\sqrt{x}}$$

$$\text{"h(x)"}, \frac{1}{2}\ \frac{4\,e^{-\sqrt{x}}+3}{\sqrt{x}\left(e^{-\sqrt{x}}+1\right)}$$

$$\text{"mean and variance"}, \frac{25}{144}, \frac{3419}{20736}$$

$$\text{"MF"}, 2^{-1-4r\sim}\,\Gamma(1+2\,r\sim)+\frac{1}{2}\,3^{-2r\sim}\,\Gamma(1+2\,r\sim)$$

$$\text{"MGF"}, \lim_{x\to\infty}\left(-\frac{1}{4}\ \frac{1}{\sqrt{-t}}\left(e^{-\frac{4}{t}}\sqrt{\pi}\left(4\,\text{erf}\left(\frac{t\sqrt{x}-2}{\sqrt{-t}}\right)+3\,\text{erf}\left(\frac{1}{2}\ \frac{2\,t\sqrt{x}-3}{\sqrt{-t}}\right)e^{\frac{7}{4t}}\right.\right.\right.$$
$$\left.\left.\left.+3\,e^{\frac{7}{4t}}\,\text{erf}\left(\frac{3}{2\sqrt{-t}}\right)+4\,\text{erf}\left(\frac{2}{\sqrt{-t}}\right)\right)\right)\right)$$

```
1/4\,{\frac {{{\rm e}^{-3\,\sqrt {x}}} \left( 4\,{{\rm e}^{-
\sqrt {x}}
}+3 \right) }{\sqrt {x}}}
```

"i is", 2,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to e^{-3y\sim^2}\left(3+4\,e^{-y\sim^2}\right)y\sim\right], [0,\infty], [\text{"Continuous"}, \text{"PDF"}]\right]$$

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

$$\text{"g(x)"}, \sqrt{x}, \text{"base"}, \frac{3}{2}\,e^{-3x}+2\,e^{-4x}, \text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"}, e^{-3x^2}\left(3+4\,e^{-x^2}\right)x$$

$$\text{"F(x)"}, \frac{1}{2}\left(2\,e^{4x^2}-e^{x^2}-1\right)e^{-4x^2}$$

$$\text{"IDF(x)"}, \left[\left[s\to\sqrt{\ln\left(RootOf\left(1+(2\,s-2)\,\_Z^4+\_Z\right)\right)}\right], [0,1], [\text{"Continuous"}, \text{"IDF"}]\right]$$

$$\text{"S(x)"}, \frac{1}{2}\left(e^{x^2}+1\right)e^{-4x^2}$$

$$\text{"h(x)"}, \frac{2\left(3\,e^{x^2}+4\right)x}{e^{x^2}+1}$$

"mean and variance", $\frac{1}{12}\sqrt{3}\sqrt{\pi}+\frac{1}{8}\sqrt{\pi}, \frac{7}{24}-\frac{7}{192}\pi-\frac{1}{48}\sqrt{3}\pi$

"MF", $\frac{1}{2}\,3^{-\frac{1}{2}r\sim}\,\Gamma\left(1+\frac{1}{2}r\sim\right)+2^{-1-r\sim}\,\Gamma\left(1+\frac{1}{2}r\sim\right)$

"MGF", $1+\frac{1}{12}t\sqrt{\pi}\,e^{\frac{1}{12}t^2}\sqrt{3}\,\mathrm{erf}\left(\frac{1}{6}t\sqrt{3}\right)+\frac{1}{8}t\sqrt{\pi}\,e^{\frac{1}{16}t^2}\,\mathrm{erf}\left(\frac{1}{4}t\right)$

$+\frac{1}{12}t\sqrt{\pi}\,e^{\frac{1}{12}t^2}\sqrt{3}+\frac{1}{8}t\sqrt{\pi}\,e^{\frac{1}{16}t^2}$

```
{{\rm e}^{-3\,{x}^{2}}} \left( 3+4\,{{\rm e}^{-{x}^{2}}} \right)
x
```

"i is", 3,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\,\frac{e^{-\frac{3}{y\sim}}\left(3+4\,e^{-\frac{1}{y\sim}}\right)}{y\sim^2}\right], [0, \infty], ["Continuous", "PDF"]\right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{x}$, "base", $\frac{3}{2}\,e^{-3x}+2\,e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\,\frac{e^{-\frac{3}{x}}\left(3+4\,e^{-\frac{1}{x}}\right)}{x^2}$

"F(x)", $\frac{1}{2}\left(e^{\frac{1}{x}}+1\right)e^{-\frac{4}{x}}$

"IDF(x)", $\left[\left[s \to \frac{1}{\ln\left(RootOf\left(2\_Z^4 s-\_Z-1\right)\right)}\right], [0, 1], ["Continuous", "IDF"]\right]$

"S(x)", $\frac{1}{2}\left(2\,e^{\frac{4}{x}}-e^{\frac{1}{x}}-1\right)e^{-\frac{4}{x}}$

"h(x)", $\frac{3\,e^{\frac{1}{x}}+4}{x^2\left(2\,e^{\frac{4}{x}}-e^{\frac{1}{x}}-1\right)}$

"mean and variance", ∞, *undefined*

"MF", $\frac{1}{2}\,3^{r\sim}\,\Gamma(1-r\sim)+2^{-1+2r\sim}\,\Gamma(1-r\sim)$

"MGF", $\left(\sqrt{3}\ \mathrm{BesselK}\left(1, 2\sqrt{-t}\sqrt{3}\right)+2\,\mathrm{BesselK}\left(1, 4\sqrt{-t}\right)\right)\sqrt{-t}$

```
1/2\,{\frac {1}{{x}^{2}}{{\rm e}^{-3\,{x}^{-1}}} \left( 3+4\,{
```

```
{\rm e}^
{-{x}^{-1}}} \right) }
```

"i is", 4,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\, e^{-3\tan(y\sim)} \left(3 + 4\, e^{-\tan(y\sim)}\right) \left(1 + \tan(y\sim)^2\right) \right], \left[0, \frac{1}{2}\,\pi\right], [\text{"Continuous"}, \text{"PDF"}] \right]$$

"l and u", 0, ∞

"g(x)", $\arctan(x)$, "base", $\frac{3}{2}\, e^{-3x} + 2\, e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\, e^{-3\tan(x)} \left(3 + 4\, e^{-\tan(x)}\right) \left(1 + \tan(x)^2\right)$

"F(x)", $\begin{cases} \frac{1}{2}\left(2\, e^{4\tan(x)} - e^{\tan(x)} - 1\right) e^{-4\tan(x)} & x \le \frac{1}{2}\,\pi \\ \infty & \frac{1}{2}\,\pi < x \end{cases}$

"IDF(x)", [[ ], [0, 1], ["Continuous", "IDF"]]

"S(x)", $\begin{cases} \frac{1}{2}\left(e^{\tan(x)} + 1\right) e^{-4\tan(x)} & x \le \frac{1}{2}\,\pi \\ -\infty & \frac{1}{2}\,\pi < x \end{cases}$

"h(x)", $\begin{cases} \frac{\left(3\, e^{\tan(x)} + 4\right)\left(1 + \tan(x)^2\right)}{e^{\tan(x)} + 1} & x \le \frac{1}{2}\,\pi \\ 0 & \frac{1}{2}\,\pi < x \end{cases}$

"mean and variance", $\frac{1}{2} \int_0^{\frac{1}{2}\pi} \frac{x\, e^{-\frac{3\sin(x)}{\cos(x)}} \left(3 + 4\, e^{-\frac{\sin(x)}{\cos(x)}}\right)}{\cos(x)^2}\, dx$, $\frac{1}{2}$

$$\int_0^{\frac{1}{2}\pi} \frac{x^2\, e^{-\frac{3\sin(x)}{\cos(x)}} \left(3 + 4\, e^{-\frac{\sin(x)}{\cos(x)}}\right)}{\cos(x)^2}\, dx - \frac{1}{4} \left(\int_0^{\frac{1}{2}\pi} \frac{x\, e^{-\frac{3\sin(x)}{\cos(x)}} \left(3 + 4\, e^{-\frac{\sin(x)}{\cos(x)}}\right)}{\cos(x)^2}\, dx \right)^2$$

$$\text{"MF"}, \int_0^{\frac{1}{2}\pi} \frac{1}{2}\, x^{r\sim}\, e^{-3\tan(x)} \left(3 + 4\, e^{-\tan(x)}\right) \left(1 + \tan(x)^2\right) dx$$

$$\text{"MGF"}, \frac{1}{2} \int_0^{\frac{1}{2}\pi} \frac{4\, e^{-\frac{-t\,x\cos(x) + 4\sin(x)}{\cos(x)}} + 3\, e^{-\frac{-t\,x\cos(x) + 3\sin(x)}{\cos(x)}}}{\cos(x)^2} dx$$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, $\frac{1}{2}\pi$

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, $\frac{1}{2}\pi$

Resetting high to RV's maximum support value

```
1/2\,{{\rm e}^{-3\,\tan \left( x \right) }} \left( 3+4\,{{\rm e}
^{-
\tan \left( x \right) }} \right)  \left( 1+ \left( \tan \left( x
 \right)  \right) ^{2} \right)
```

"i is", 5,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\ \frac{3\,y\sim + 4}{y\sim^5}\right], [1, \infty], [\text{"Continuous"}, \text{"PDF"}]\right]$$

"l and u", 0, ∞

"g(x)", e^x, "base", $\frac{3}{2}\ e^{-3x} + 2\, e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

$$\text{"f(x)"}, \frac{1}{2}\ \frac{3x + 4}{x^5}$$

$$\text{"F(x)"}, \frac{1}{2}\ \frac{2x^4 - x - 1}{x^4}$$

"IDF(x)", $[[s \to RootOf(1 + (2s - 2)\ \_Z^4 + \_Z)]$, $[0, 1]$, ["Continuous", "IDF"]]

$$\text{"S(x)"}, \frac{1}{2}\ \frac{x + 1}{x^4}$$

$$\text{"h(x)"}, \frac{3x + 4}{x\,(x + 1)}$$

"mean and variance", $\frac{17}{12}, \frac{71}{144}$

"MF", $\lim_{x \to \infty} \frac{1}{2} \frac{3\, x^{r\sim - 4}\, r\sim\, x + 4\, r\sim\, x^{r\sim - 4} - 12\, x^{r\sim - 4}\, x - 12\, x^{r\sim - 4} - 7\, r\sim + 24}{(-3 + r\sim)\,(r\sim - 4)}$

"MGF", $\lim_{x \to \infty} \frac{1}{12} \frac{1}{x^4} \left(-\mathrm{Ei}(1, -t\,x)\, t^4\, x^4 + \mathrm{Ei}(1, -t)\, t^4\, x^4 + e^t\, t^3\, x^4 - 3\, \mathrm{Ei}(1, -t\,x)\, t^3\, x^4 \right.$
$+ 3\, \mathrm{Ei}(1, -t)\, t^3\, x^4 + 4\, e^t\, t^2\, x^4 - e^{t\,x}\, t^3\, x^3 + 5\, e^t\, t\, x^4 - 3\, e^{t\,x}\, t^2\, x^3 + 12\, e^t\, x^4 - e^{t\,x}\, t^2\, x^2$
$\left. - 3\, e^{t\,x}\, t\, x^2 - 2\, e^{t\,x}\, t\, x - 6\, e^{t\,x}\, x - 6\, e^{t\,x} \right)$

WARNING(PlotDist): Low value provided by user, 0
is less than minimum support value of random variable
1
Resetting low to RV's minimum support value
WARNING(PlotDist): Low value provided by user, 0
is less than minimum support value of random variable
1
Resetting low to RV's minimum support value

```
1/2\,{\frac {3\,x+4}{{x}^{5}}}
```

"i is", 6,

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

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

$l := 0$

$u := \infty$

$Temp := \left[\left[y\sim \to \frac{1}{2}\, e^{-3\, e^{y\sim} + y\sim} \left(3 + 4\, e^{-e^{y\sim}} \right) \right], [-\infty, \infty], [\text{"Continuous"}, \text{"PDF"}] \right]$

"l and u", 0, ∞

"g(x)", $\ln(x)$, "base", $\frac{3}{2}\, e^{-3\,x} + 2\, e^{-4\,x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\, e^{-3\, e^x + x} \left(3 + 4\, e^{-e^x} \right)$

"F(x)", $\frac{1}{2} \left(2\, e^{4\, e^x} - e^{e^x} - 1 \right) e^{-4\, e^x}$

"IDF(x)", $\left[\left[\ln^{(2)} @ \left(s \to RootOf\left(1 + (2\,s - 2)\, \_Z^4 + \_Z \right) \right) \right], [0, 1], [\text{"Continuous"}, \text{"IDF"}] \right]$

"S(x)", $\frac{1}{2} \left(e^{e^x} + 1 \right) e^{-4\, e^x}$

"h(x)", $\frac{\left(3\, e^{e^x} + 4 \right) e^x}{e^{e^x} + 1}$

"mean and variance", $\int_{-\infty}^{\infty} \frac{1}{2}\, x\, e^{-3\, e^x + x} \left(3 + 4\, e^{-e^x} \right) dx, \int_{-\infty}^{\infty} \frac{1}{2}\, x^2\, e^{-3\, e^x + x} \left(3 + 4\, e^{-e^x} \right) dx$

$$-\left(\int_{-\infty}^{\infty} \frac{1}{2}\, x\, e^{-3\,e^{x}+x}\left(3+4\,e^{-e^{x}}\right) dx\right)^{2}$$

$$\text{"MF"}, \int_{-\infty}^{\infty} \frac{1}{2}\, x^{r\sim}\, e^{-3\,e^{x}+x}\left(3+4\,e^{-e^{x}}\right) dx$$

$$\text{"MGF"}, \int_{-\infty}^{\infty} \frac{1}{2}\left(3+4\,e^{-e^{x}}\right) e^{t\,x-3\,e^{x}+x}\, dx$$

```
1/2\,{{\rm e}^{-3\,{{\rm e}^{x}}+x}} \left( 3+4\,{{\rm e}^{-{
{\rm e}^{
x}}}} \right)
```

"i is", 7,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\, y\sim^{2}\,(3+4\,y\sim)\right], [0, 1], [\text{"Continuous"}, \text{"PDF"}]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"}, e^{-x}, \text{"base"}, \frac{3}{2}\, e^{-3\,x}+2\,e^{-4\,x}, \text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"}, \frac{1}{2}\, x^{2}\,(3+4\,x)$$

$$\text{"F(x)"}, \frac{1}{2}\, x^{4}+\frac{1}{2}\, x^{3}$$

$$\text{"IDF(x)"}, [[s \to RootOf(\_Z^{4}+\_Z^{3}-2\,s)], [0, 1], [\text{"Continuous"}, \text{"IDF"}]]$$

$$\text{"S(x)"}, 1-\frac{1}{2}\, x^{4}-\frac{1}{2}\, x^{3}$$

$$\text{"h(x)"}, -\frac{x^{2}\,(3+4\,x)}{x^{4}+x^{3}-2}$$

$$\text{"mean and variance"}, \frac{31}{40}, \frac{157}{4800}$$

$$\text{"MF"}, \frac{1}{2}\, \frac{7\,r\sim+24}{r\sim^{2}+7\,r\sim+12}$$

$$\text{"MGF"}, \frac{1}{2}\, \frac{7\,e^{t}\,t^{3}-18\,e^{t}\,t^{2}+30\,e^{t}\,t-24\,e^{t}-6\,t+24}{t^{4}}$$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, 1

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random*

variable, 1

Resetting high to RV's maximum support value

```
1/2\,{x}^{2} \left( 3+4\,x \right)
```

"i is", 8,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\, e^{-3\,e^{-y\sim}-y\sim} \left(3+4\,e^{-e^{-y\sim}} \right) \right], [-\infty, \infty], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", $-\ln(x)$, "base", $\frac{3}{2}\, e^{-3x} + 2\, e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\, e^{-3\,e^{-x}-x} \left(3+4\,e^{-e^{-x}} \right)$

"F(x)", $\frac{1}{2} \left(e^{e^{-x}}+1 \right) e^{-4\,e^{-x}}$

"IDF(x)", $[[s \to -\ln(\ln(RootOf(2\,\_Z^4\,s - \_Z - 1)))], [0, 1], ["Continuous", "IDF"]]$

"S(x)", $\frac{1}{2} \left(2\,e^{4\,e^{-x}} - e^{e^{-x}} - 1 \right) e^{-4\,e^{-x}}$

"h(x)", $\frac{\left(3\,e^{e^{-x}}+4 \right) e^{-x}}{2\,e^{4\,e^{-x}} - e^{e^{-x}} - 1}$

"mean and variance", $\int_{-\infty}^{\infty} \frac{1}{2}\, x\, e^{-3\,e^{-x}-x} \left(3+4\,e^{-e^{-x}} \right) dx$, $\int_{-\infty}^{\infty} \frac{1}{2}\, x^2\, e^{-3\,e^{-x}-x} \left(3+4\,e^{-e^{-x}} \right) dx$

$$- \left(\int_{-\infty}^{\infty} \frac{1}{2}\, x\, e^{-3\,e^{-x}-x} \left(3+4\,e^{-e^{-x}} \right) dx \right)^2$$

"MF", $\int_{-\infty}^{\infty} \frac{1}{2}\, x^{r\sim}\, e^{-3\,e^{-x}-x} \left(3+4\,e^{-e^{-x}} \right) dx$

"MGF", $\int_{-\infty}^{\infty} \frac{1}{2} \left(3+4\,e^{-e^{-x}} \right) e^{tx-3\,e^{-x}-x}\, dx$

```
1/2\,{{\rm e}^{-3\,{{\rm e}^{-x}}-x}} \left( 3+4\,{{\rm e}^{-{
{\rm e}^
{-x}}}} \right)
```

"i is", 9,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\left(3\,e^{-3\,e^{y\sim}+3}+4\,e^{-4\,e^{y\sim}+4}\right)e^{y\sim}\right],\ [0,\ \infty],\ ["Continuous",\ "PDF"]\right]$$

"l and u", 0, ∞

"g(x)", $\ln(x+1)$, "base", $\frac{3}{2}\,e^{-3x}+2\,e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x}$

"F(x)", $1-\frac{1}{2}\,e^{-3\,e^{x}+3}-\frac{1}{2}\,e^{-4\,e^{x}+4}$

"IDF(x)", $\left[\left[s\to \ln\left(1-\ln\left(RootOf\left(\_Z^4+\_Z^3+2\,s-2\right)\right)\right)\right],\ [0,\ 1],\ ["Continuous",\ "IDF"]\right]$

"S(x)", $\frac{1}{2}\,e^{-3\,e^{x}+3}+\frac{1}{2}\,e^{-4\,e^{x}+4}$

"h(x)", $\frac{\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x}}{e^{-3\,e^{x}+3}+e^{-4\,e^{x}+4}}$

"mean and variance", $\int_0^{\infty}\frac{1}{2}\,x\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x}\,dx$, $\int_0^{\infty}\frac{1}{2}\,x^2\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x}\,dx-\left(\int_0^{\infty}\frac{1}{2}\,x\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x}\,dx\right)^2$

"MF", $\int_0^{\infty}\frac{1}{2}\,x^{r\sim}\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x}\,dx$

"MGF", $\int_0^{\infty}\frac{1}{2}\left(3\,e^{-3\,e^{x}+3}+4\,e^{-4\,e^{x}+4}\right)e^{x(t+1)}\,dx$

```
1/2\, \left( 3\,{{\rm e}^{-3\,{{\rm e}^{x}}+3}}+4\,{{\rm e}^{-4\,{{\rm e}^{x}}+4}} \right) {{\rm e}^{x}}
```

"i is", 10,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\,\frac{\left(3\,e^{-3\,e^{\frac{1}{y\sim}}+6}+4\,e^{-4\,e^{\frac{1}{y\sim}}+8}\right)e^{\frac{1}{y\sim}}}{y\sim^2}\right],\left[0,\ \frac{1}{\ln(2)}\right],\ ["Continuous",\ "PDF"]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"}, \frac{1}{\ln(x+2)}, \text{"base"}, \frac{3}{2}\, e^{-3x} + 2\, e^{-4x}, \text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"}, \frac{1}{2}\, \frac{\left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{1}{x}}}{x^2}$$

$$\text{"F(x)"}, \frac{1}{2}\left(e^{6+e^{\frac{1}{x}}} + e^{8}\right) e^{-4\, e^{\frac{1}{x}}}$$

$$\text{"IDF(x)"}, \left[\left[s \to \frac{1}{\ln\left(2 + \ln\left(RootOf\left(2\, \_Z^4\, s - \_Z - 1\right)\right)\right)}\right], [0, 1], [\text{"Continuous"}, \text{"IDF"}]\right]$$

$$\text{"S(x)"}, 1 - \frac{1}{2}\, e^{-3\, e^{\frac{1}{x}}+6} - \frac{1}{2}\, e^{-4\, e^{\frac{1}{x}}+8}$$

$$\text{"h(x)"}, -\frac{\left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{1}{x}}}{x^2\left(-2 + e^{-3\, e^{\frac{1}{x}}+6} + e^{-4\, e^{\frac{1}{x}}+8}\right)}$$

$$\text{"mean and variance"}, \frac{1}{2}\int_0^{\frac{1}{\ln(2)}} \frac{\left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{1}{x}}}{x}\, dx, \frac{1}{2}\int_0^{\frac{1}{\ln(2)}} \left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{1}{x}}\, dx - \frac{1}{4}\left(\int_0^{\frac{1}{\ln(2)}} \frac{\left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{1}{x}}}{x}\, dx\right)^2$$

$$\text{"MF"}, \int_0^{\frac{1}{\ln(2)}} \frac{1}{2}\, \frac{x^{r\sim}\left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{1}{x}}}{x^2}\, dx$$

$$\text{"MGF"}, \frac{1}{2}\int_0^{\frac{1}{\ln(2)}} \frac{\left(3\, e^{-3\, e^{\frac{1}{x}}+6} + 4\, e^{-4\, e^{\frac{1}{x}}+8}\right) e^{\frac{t x^2+1}{x}}}{x^2}\, dx$$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable,* $\frac{1}{\ln(2)}$

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40

is greater than maximum support value of the random

variable, $\frac{1}{\ln(2)}$

Resetting high to RV's maximum support value

```
1/2\,{\frac { \left( 3\,{{\rm e}^{-3\,{{\rm e}^{{x}^{-1}}}}+6}}
+4\,{
{\rm e}^{-4\,{{\rm e}^{{x}^{-1}}}+8}} \right) {{\rm e}^{{x}^{-1}
}}}{{x
}^{2}}}
"i is", 11,
    " ----------------------------------------------------------------------------------------------------
    ----------"
```

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2} \, \frac{-4\,y\sim + 3\sqrt{-y\sim^2 + 1} + 4}{(y\sim + 1)^3} \right], [0, 1], ["Continuous", "PDF"] \right]$$

"l and u", 0, ∞

"g(x)", $\tanh(x)$, "base", $\frac{3}{2}\, e^{-3x} + 2\, e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2} \, \frac{-4\,x + 3\sqrt{-x^2 + 1} + 4}{(x + 1)^3}$

"F(x)", $\frac{1}{2} \, \frac{x^2 + x\sqrt{-x^2 + 1} + 6\,x - \sqrt{-x^2 + 1} + 1}{x^2 + 2\,x + 1}$

"IDF(x)", $[[s \to RootOf((2\,s^2 - 2\,s + 1)\,\_Z^4 + (8\,s^2 - 16\,s + 5)\,\_Z^3 + (12\,s^2 - 28\,s + 19)\,\_Z^2 + (8\,s^2 - 16\,s + 7)\,\_Z + 2\,s^2 - 2\,s)], [0, 1], ["Continuous", "IDF"]]$

"S(x)", $-\frac{1}{2} \, \frac{x\sqrt{-x^2 + 1} - x^2 - \sqrt{-x^2 + 1} + 2\,x - 1}{x^2 + 2\,x + 1}$

"h(x)", $-\frac{-4\,x + 3\sqrt{-x^2 + 1} + 4}{\left(x\sqrt{-x^2 + 1} - x^2 - \sqrt{-x^2 + 1} + 2\,x - 1\right)(x + 1)}$

"mean and variance", $4 - \frac{3}{4}\,\pi - 2\ln(2)$, $-\frac{25}{2} + \frac{9}{4}\,\pi + 8\ln(2) - \left(4 - \frac{3}{4}\,\pi - 2\ln(2)\right)^2$

"MF", $-r\sim + \frac{1}{2} - r\sim\,(r\sim + 1)\,\text{LerchPhi}(-1, 1, -r\sim) - \pi\csc(\pi\,r\sim)\,r\sim\,(r\sim + 1)$

$$+ \frac{3}{4} \, \frac{1}{\sqrt{\pi}} \left(\frac{1}{2} \, \frac{1}{\Gamma\left(2 + \frac{1}{2}\,r\sim\right)} \left(\pi\,\Gamma\left(\frac{1}{2}\,r\sim + \frac{1}{2} \right) \text{hypergeom}\left(\left[\frac{3}{2}, 2, \frac{1}{2}\,r\sim \right. \right. \right.$$

$$+\frac{1}{2}\Big],\Big[\frac{1}{2},2+\frac{1}{2}\,r\sim\Big],1\Big)\Big)$$

$$-\frac{3}{2}\,\frac{\pi\,\Gamma\Big(\frac{1}{2}\,r\sim+1\Big)\,\text{hypergeom}\Big(\Big[2,\frac{5}{2},\frac{1}{2}\,r\sim+1\Big],\Big[\frac{3}{2},\frac{5}{2}+\frac{1}{2}\,r\sim\Big],1\Big)}{\Gamma\Big(\frac{5}{2}+\frac{1}{2}\,r\sim\Big)}\Bigg)-r\sim\,($$

$$-1+r\sim)\,\text{LerchPhi}(-1,1,-r\sim)-\pi\csc(\pi\,r\sim)\,r\sim\,(-1+r\sim)$$

$$\text{"MGF"},\ \frac{1}{2}\int_0^1\frac{e^{t\,x}\left(-4\,x+3\sqrt{-x^2+1}+4\right)}{(x+1)^3}\,dx$$

WARNING(PlotDist): High value provided by user, 40
is greater than maximum support value of the random variable, 1
Resetting high to RV's maximum support value
WARNING(PlotDist): High value provided by user, 40
is greater than maximum support value of the random variable, 1
Resetting high to RV's maximum support value

```
1/2\,{\frac {-4\,x+3\,\sqrt {-{x}^{2}+1}+4}{ \left( x+1 \right) ^{3}}}
```

"i is", 12,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to\frac{1}{2}\,\frac{3\,y\sim+3\sqrt{y\sim^2+1}+4}{\left(y\sim+\sqrt{y\sim^2+1}\right)^4\sqrt{y\sim^2+1}}\right],[0,\infty],[\text{"Continuous"},\text{"PDF"}]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"},\sinh(x),\text{"base"},\frac{3}{2}\,e^{-3\,x}+2\,e^{-4\,x},\text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"},\ \frac{1}{2}\,\frac{3\,x+3\sqrt{x^2+1}+4}{\left(x+\sqrt{x^2+1}\right)^4\sqrt{x^2+1}}$$

$$\text{"F(x)"},\ \frac{1}{2}-2\sqrt{x^2+1}\,x^2-\frac{1}{2}\sqrt{x^2+1}+2\,x^3+\frac{3}{2}\,x+4\sqrt{x^2+1}\,x^3+2\sqrt{x^2+1}\,x-4\,x^4-4\,x^2$$

$$\text{"IDF(x)"},\left[\left[s\to RootOf\left((16\,s-16)\,\_Z^4+(-8\,s+8)\,\_Z^3+(16\,s-16)\,\_Z^2+(-6\,s+7)\,\_Z+2\,s^2-2\,s\right)\right],[0,1],[\text{"Continuous"},\text{"IDF"}]\right]$$

"S(x)", $\frac{1}{2}+2\sqrt{x^2+1}\,x^2+\frac{1}{2}\sqrt{x^2+1}-2x^3-\frac{3}{2}x-4\sqrt{x^2+1}\,x^3-2\sqrt{x^2+1}\,x+4x^4+4x^2$

"h(x)", $-\left(3x+3\sqrt{x^2+1}+4\right)\Big/\left(\left(x+\sqrt{x^2+1}\right)^4\sqrt{x^2+1}\left(8\sqrt{x^2+1}\,x^3-8x^4-4\sqrt{x^2+1}\,x^2+4x^3+4\sqrt{x^2+1}\,x-8x^2-\sqrt{x^2+1}+3x-1\right)\right)$

"mean and variance",

$$\frac{1}{16}\,\frac{3\pi+32\,\text{MeijerG}\left(\left[\left[-2,-\frac{3}{2},-1\right],[\,]\right],\left[\left[-\frac{1}{2},-\frac{3}{2}\right],\left[-\frac{9}{2}\right]\right],1\right)}{\pi},$$

$$\frac{\frac{3}{2}\,\text{MeijerG}\left(\left[\left[-2,-\frac{3}{2},0\right],[\,]\right],\left[\left[-\frac{1}{2},-\frac{1}{2}\right],\left[-\frac{9}{2}\right]\right],1\right)+\frac{83}{420}\,\pi}{\pi}$$

$$-\frac{1}{256}\,\frac{\left(3\pi+32\,\text{MeijerG}\left(\left[\left[-2,-\frac{3}{2},-1\right],[\,]\right],\left[\left[-\frac{1}{2},-\frac{3}{2}\right],\left[-\frac{9}{2}\right]\right],1\right)\right)^2}{\pi^2}$$

"MF", $\frac{3}{2}\,\frac{1}{\pi}\Bigg(-2\sqrt{\pi}\,\Gamma\left(\frac{3}{2}+\frac{1}{2}\,r\sim\right)\Gamma\left(-1-\frac{1}{2}\,r\sim\right)\text{hypergeom}\left(\left[-\frac{3}{2},\frac{5}{2},\frac{3}{2}+\frac{1}{2}\,r\sim\right],\left[\frac{3}{2},2+\frac{1}{2}\,r\sim\right],1\right)-\frac{1}{2}\,\frac{\Gamma\left(1+\frac{1}{2}\,r\sim\right)\pi^{3/2}\sec\left(\frac{1}{2}\,\pi\,r\sim\right)}{\Gamma\left(\frac{3}{2}+\frac{1}{2}\,r\sim\right)}$

$$+\frac{4\,\Gamma\left(2+\frac{1}{2}\,r\sim\right)\pi^{3/2}\sec\left(\frac{1}{2}\,\pi\,r\sim\right)}{\Gamma\left(\frac{5}{2}+\frac{1}{2}\,r\sim\right)}-\frac{4\,\Gamma\left(3+\frac{1}{2}\,r\sim\right)\pi^{3/2}\sec\left(\frac{1}{2}\,\pi\,r\sim\right)}{\Gamma\left(\frac{7}{2}+\frac{1}{2}\,r\sim\right)}$$

$$+\frac{1}{(1+r\sim)\,(3+r\sim)\,(5+r\sim)}\left(8\sqrt{\pi}\,\Gamma\left(\frac{3}{2}-\frac{1}{2}\,r\sim\right)\Gamma\left(1+\frac{1}{2}\,r\sim\right)\text{hypergeom}\left(\left[\frac{1}{2},\frac{3}{2}-\frac{1}{2}\,r\sim,-\frac{5}{2}-\frac{1}{2}\,r\sim\right],\left[-\frac{1}{2}\,r\sim,\frac{1}{2}-\frac{1}{2}\,r\sim\right],1\right)\right)$$

$$+\frac{12\,\Gamma\left(\frac{3}{2}-\frac{1}{2}\,r\sim\right)\Gamma\left(1+\frac{1}{2}\,r\sim\right)}{\sqrt{\pi}\,(1+r\sim)\,(3+r\sim)\,(5+r\sim)}+\frac{1}{\pi}\Bigg(2\Bigg(-2\sqrt{\pi}\,\Gamma\left(1+\frac{1}{2}\,r\sim\right)\Gamma\left(-\frac{1}{2}-\frac{1}{2}\,r\sim\right)\text{hypergeom}\left(\left[-\frac{3}{2},\frac{5}{2},1+\frac{1}{2}\,r\sim\right],\left[\frac{3}{2},\frac{3}{2}+\frac{1}{2}\,r\sim\right],1\right)$$

$$-\frac{1}{2}\,\frac{\Gamma\left(\frac{1}{2}+\frac{1}{2}\,r\sim\right)\pi^{3/2}\csc\left(\frac{1}{2}\,\pi\,r\sim\right)}{\Gamma\left(1+\frac{1}{2}\,r\sim\right)}+\frac{4\,\Gamma\left(\frac{3}{2}+\frac{1}{2}\,r\sim\right)\pi^{3/2}\csc\left(\frac{1}{2}\,\pi\,r\sim\right)}{\Gamma\left(2+\frac{1}{2}\,r\sim\right)}$$

$$-\frac{4\,\Gamma\left(\frac{5}{2}+\frac{1}{2}\,r\sim\right)\pi^{3/2}\csc\left(\frac{1}{2}\,\pi\,r\sim\right)}{\Gamma\left(3+\frac{1}{2}\,r\sim\right)}+\frac{1}{r\sim\,(2+r\sim)\,(4+r\sim)}\left(8\sqrt{\pi}\,\Gamma\left(-\frac{1}{2}\,r\sim+2\right)\Gamma\left(\frac{1}{2}+\frac{1}{2}\,r\sim\right)\text{hypergeom}\left(\left[\frac{1}{2},\,-2-\frac{1}{2}\,r\sim,\,-\frac{1}{2}\,r\sim+2\right],\left[1-\frac{1}{2}\,r\sim,\,\frac{1}{2}-\frac{1}{2}\,r\sim\right],1\right)\right)\right)$$

$$\text{"MGF"},\int_0^\infty \frac{1}{2}\,\frac{e^{t\,x}\left(3\,x+3\sqrt{x^2+1}+4\right)}{\left(x+\sqrt{x^2+1}\right)^4\sqrt{x^2+1}}\,dx$$

```
1/2\,{\frac {3\,x+3\,\sqrt {{x}^{2}+1}+4}{ \left( x+\sqrt {{x}^{2}+1}
 \right) ^{4}\sqrt {{x}^{2}+1}}}
```

"i is", 13,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim\to \frac{1}{2}\,e^{-3\sinh(y\sim)}\left(4\,e^{-\sinh(y\sim)}+3\right)\cosh(y\sim)\right],\,[0,\,\infty],\,[\text{"Continuous"},\,\text{"PDF"}]\right]$$

"l and u", 0, ∞

"g(x)", $\text{arcsinh}(x)$, "base", $\frac{3}{2}\,e^{-3\,x}+2\,e^{-4\,x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\,e^{-3\sinh(x)}\left(4\,e^{-\sinh(x)}+3\right)\cosh(x)$

"F(x)", $-\frac{1}{2}\,e^{-\frac{3}{2}\left(e^{2\,x}-1\right)e^{-x}}+1-\frac{1}{2}\,e^{-2\left(e^{2\,x}-1\right)e^{-x}}$

"IDF(x)", $\left[\left[s\to -\ln\left(\ln\left(RootOf\left(\_Z^4+\_Z^3+2\,s-2\right)\right)+\sqrt{\ln\left(RootOf\left(\_Z^4+\_Z^3+2\,s-2\right)\right)^2+1}\right)\right],\,[0,\,1],\,[\text{"Continuous"},\,\text{"IDF"}]\right]$

"S(x)", $\frac{1}{2}\,e^{-\frac{3}{2}\left(e^{2\,x}-1\right)e^{-x}}+\frac{1}{2}\,e^{-2\left(e^{2\,x}-1\right)e^{-x}}$

"h(x)", $\frac{e^{-3\sinh(x)}\left(4\,e^{-\sinh(x)}+3\right)\cosh(x)}{e^{-\frac{3}{2}\left(e^{2\,x}-1\right)e^{-x}}+e^{-2\left(e^{2\,x}-1\right)e^{-x}}}$

"mean and variance", $\int_0^\infty \frac{1}{2}\, x\, e^{-3\sinh(x)}\left(4\, e^{-\sinh(x)}+3\right)\cosh(x)\, dx$,

$\int_0^\infty \frac{1}{2}\, x^2\, e^{-3\sinh(x)}\left(4\, e^{-\sinh(x)}+3\right)\cosh(x)\, dx - \left(\int_0^\infty \frac{1}{2}\, x\, e^{-3\sinh(x)}\left(4\, e^{-\sinh(x)}+3\right)\cosh(x)\, dx\right)^2$

"MF", $\int_0^\infty \frac{1}{2}\, x^{r\sim}\, e^{-3\sinh(x)}\left(4\, e^{-\sinh(x)}+3\right)\cosh(x)\, dx$

"MGF", $\int_0^\infty \frac{1}{2}\left(4\, e^{-\sinh(x)}+3\right)\cosh(x)\, e^{t x-3\sinh(x)}\, dx$

```
1/2\,{{\rm e}^{-3\,\sinh \left( x \right) }} \left( 4\,{{\rm e}^{-
\sinh \left( x \right) }}+3 \right) \cosh \left( x \right)
```

"i is", 14,

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

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

$l := 0$

$u := \infty$

$Temp := \left[\left[y\sim \to \frac{1}{2}\, \frac{3\, e^{3-3\,\operatorname{arccsch}(y\sim)}+4\, e^{4-4\,\operatorname{arccsch}(y\sim)}}{\sqrt{y\sim^2+1}\ |y\sim|}\right], \left[0, \frac{2}{e-e^{-1}}\right], \text{["Continuous", "PDF"]}\right]$

"l and u", 0, ∞

"g(x)", $\operatorname{csch}(x+1)$, "base", $\frac{3}{2}\, e^{-3x}+2\, e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\, \frac{3\, e^{3-3\,\operatorname{arccsch}(x)}+4\, e^{4-4\,\operatorname{arccsch}(x)}}{\sqrt{x^2+1}\ |x|}$

"F(x)", $\frac{1}{2}\int_0^x \frac{3\, e^{3-3\,\operatorname{arccsch}(t)}+4\, e^{4-4\,\operatorname{arccsch}(t)}}{\sqrt{t^2+1}\ |t|}\, dt$

"S(x)", $1-\frac{1}{2}\int_0^x \frac{3\, e^{3-3\,\operatorname{arccsch}(t)}+4\, e^{4-4\,\operatorname{arccsch}(t)}}{\sqrt{t^2+1}\ |t|}\, dt$

"h(x)", $-\frac{3\,e^{3-3\,\mathrm{arccsch}(x)}+4\,e^{4-4\,\mathrm{arccsch}(x)}}{\sqrt{x^2+1}\;|x|\left(-2+\int_0^x \frac{3\,e^{3-3\,\mathrm{arccsch}(t)}+4\,e^{4-4\,\mathrm{arccsch}(t)}}{\sqrt{t^2+1}\;|t|}\,dt\right)}$

"mean and variance", $\frac{1}{2}\int_0^{\frac{2e}{e^2-1}} \frac{3\,e^{3-3\,\mathrm{arccsch}(x)}+4\,e^{4-4\,\mathrm{arccsch}(x)}}{\sqrt{x^2+1}}\,dx$, $\frac{1}{2}\int_0^{\frac{2e}{e^2-1}} \frac{x\left(3\,e^{3-3\,\mathrm{arccsch}(x)}+4\,e^{4-4\,\mathrm{arccsch}(x)}\right)}{\sqrt{x^2+1}}\,dx - \frac{1}{4}\left(\int_0^{\frac{2e}{e^2-1}} \frac{3\,e^{3-3\,\mathrm{arccsch}(x)}+4\,e^{4-4\,\mathrm{arccsch}(x)}}{\sqrt{x^2+1}}\,dx\right)^2$

"MF", $\int_0^{\frac{2}{e-e^{-1}}} \frac{1}{2}\,\frac{x^{r\sim}\left(3\,e^{3-3\,\mathrm{arccsch}(x)}+4\,e^{4-4\,\mathrm{arccsch}(x)}\right)}{\sqrt{x^2+1}\;|x|}\,dx$

"MGF", $\frac{1}{2}\int_0^{\frac{2e}{e^2-1}} \frac{e^{tx}\left(3\,e^{3-3\,\mathrm{arccsch}(x)}+4\,e^{4-4\,\mathrm{arccsch}(x)}\right)}{\sqrt{x^2+1}\;x}\,dx$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable,* $\frac{2}{e-e^{-1}}$

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable,* $\frac{2}{e-e^{-1}}$

Resetting high to RV's maximum support value

```
1/2\,{\frac {3\,{{\rm e}^{3-3\,{\rm arccsch} \left(x\right)}}
+4\,{
{\rm e}^{4-4\,{\rm arccsch} \left(x\right)}}}{\sqrt {{x}^{2}+1}
 \left| x \right| }}
```

"i is", 15,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2} \, \frac{e^{\frac{3(\sinh(y\sim)-1)}{\sinh(y\sim)}} \left(4\, e^{\frac{\sinh(y\sim)-1}{\sinh(y\sim)}} + 3 \right) \cosh(y\sim)}{\sinh(y\sim)^2} \right], \left[0, \ln\left(1+\sqrt{2}\right) \right], \right.$$

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

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

$$\text{"g(x)"}, \operatorname{arccsch}(x+1), \text{"base"}, \frac{3}{2}\, e^{-3x} + 2\, e^{-4x}, \text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"}, \frac{1}{2} \, \frac{e^{\frac{3(\sinh(x)-1)}{\sinh(x)}} \left(4\, e^{\frac{\sinh(x)-1}{\sinh(x)}} + 3 \right) \cosh(x)}{\sinh(x)^2}$$

$$\text{"F(x)"}, \frac{1}{2}\, e^{-\frac{-3e^{2x}+8e^{x}+4}{e^{2x}-1}} \left(e^{\frac{2e^{x}+1}{e^{2x}-1}} + e^{\frac{e^{2x}}{e^{2x}-1}} \right)$$

$$\text{"S(x)"}, 1 - \frac{1}{2}\, e^{\frac{3(e^{2x}-2e^{x}-1)}{e^{2x}-1}} - \frac{1}{2}\, e^{\frac{4(e^{2x}-2e^{x}-1)}{e^{2x}-1}}$$

$$\text{"h(x)"}, -\frac{e^{\frac{3(\sinh(x)-1)}{\sinh(x)}} \left(4\, e^{\frac{\sinh(x)-1}{\sinh(x)}} + 3 \right) \cosh(x)}{\sinh(x)^2 \left(-2 + e^{-\frac{3(-e^{2x}+2e^{x}+1)}{e^{2x}-1}} + e^{-\frac{4(-e^{2x}+2e^{x}+1)}{e^{2x}-1}} \right)}$$

$$\text{"mean and variance"}, \int_0^{\ln\left(1+\sqrt{2}\right)} \frac{\cosh(x)\, x\, e^{\frac{3(\sinh(x)-1)}{\sinh(x)}} \left(4\, e^{\frac{\sinh(x)-1}{\sinh(x)}} + 3 \right)}{-1+\cosh(2x)}\, dx,$$

$$\int_0^{\ln\left(1+\sqrt{2}\right)} \frac{\cosh(x)\, x^2\, e^{\frac{3(\sinh(x)-1)}{\sinh(x)}} \left(4\, e^{\frac{\sinh(x)-1}{\sinh(x)}} + 3 \right)}{-1+\cosh(2x)}\, dx$$

$$- \left(\int_0^{\ln\left(1+\sqrt{2}\right)} \frac{\cosh(x)\, x\, e^{\frac{3(\sinh(x)-1)}{\sinh(x)}} \left(4\, e^{\frac{\sinh(x)-1}{\sinh(x)}} + 3 \right)}{-1+\cosh(2x)}\, dx \right)^2$$

$$\text{"MF"}, \int_0^{\ln\left(1+\sqrt{2}\right)} \frac{1}{2} \, \frac{x^{r\sim}\, e^{\frac{3(\sinh(x)-1)}{\sinh(x)}} \left(4\, e^{\frac{\sinh(x)-1}{\sinh(x)}} + 3 \right) \cosh(x)}{\sinh(x)^2}\, dx$$

"MGF", $\int_0^{\ln(1+\sqrt{2})} \frac{\cosh(x)\left(4\,e^{\frac{t\,x\sinh(x)+4\sinh(x)-4}{\sinh(x)}}+3\,e^{\frac{t\,x\sinh(x)+3\sinh(x)-3}{\sinh(x)}}\right)}{-1+\cosh(2\,x)}\,dx$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, $\ln(1+\sqrt{2})$

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, $\ln(1+\sqrt{2})$

Resetting high to RV's maximum support value

```
1/2\,{\frac {\cosh \left( x \right) }{ \left( \sinh \left( x
\right)
 \right) ^{2}}{\rm e}^{3\,{\frac {\sinh \left( x \right) -1}
{\sinh
 \left( x \right) }}}} \left( 4\,{{\rm e}^{{\frac {\sinh \left(
x
 \right) -1}{\sinh \left( x \right) }}}}+3 \right) }
```

"i is", 16,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\,\frac{3\,e^{3-3\,\mathrm{arctanh}\left(\frac{1}{y\sim}\right)}+4\,e^{4-4\,\mathrm{arctanh}\left(\frac{1}{y\sim}\right)}}{y\sim^2-1}\right],\left[1,\frac{e+e^{-1}}{e-e^{-1}}\right],\text{["Continuous", "PDF"]}\right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\tanh(x+1)}$, "base", $\frac{3}{2}\,e^{-3x}+2\,e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\,\frac{3\,e^{3-3\,\mathrm{arctanh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arctanh}\left(\frac{1}{x}\right)}}{x^2-1}$

"F(x)", $\frac{1}{2}\int_1^x \frac{3\,e^{3-3\,\mathrm{arctanh}\left(\frac{1}{t}\right)}+4\,e^{4-4\,\mathrm{arctanh}\left(\frac{1}{t}\right)}}{t^2-1}\,dt$

$$\text{"S(x)"}, 1 - \frac{1}{2}\int_1^x \frac{3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{t}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{t}\right)}}{t^2-1}\,dt$$

$$\text{"h(x)"}, -\frac{3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{x}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{x}\right)}}{(x^2-1)\left(-2 + \int_1^x \frac{3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{t}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{t}\right)}}{t^2-1}\,dt\right)}$$

$$\text{"mean and variance"}, \frac{1}{2}\int_1^{\frac{e^2+1}{e^2-1}} \frac{x\left(3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{x}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{x}\right)}\right)}{x^2-1}\,dx, \frac{1}{2}\int_1^{\frac{e^2+1}{e^2-1}} \frac{x^2\left(3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{x}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{x}\right)}\right)}{x^2-1}\,dx - \frac{1}{4}\left(\int_1^{\frac{e^2+1}{e^2-1}} \frac{x\left(3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{x}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{x}\right)}\right)}{x^2-1}\,dx\right)^2$$

$$\text{"MF"}, \int_1^{\frac{e+e^{-1}}{e-e^{-1}}} \frac{1}{2}\,\frac{x^{r\sim}\left(3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{x}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{x}\right)}\right)}{x^2-1}\,dx$$

$$\text{"MGF"}, \frac{1}{2}\int_1^{\frac{e^2+1}{e^2-1}} \frac{e^{tx}\left(3\,e^{3-3\operatorname{arctanh}\left(\frac{1}{x}\right)} + 4\,e^{4-4\operatorname{arctanh}\left(\frac{1}{x}\right)}\right)}{x^2-1}\,dx$$

WARNING(PlotDist): Low value provided by user, 0
is less than minimum support value of random variable
1
Resetting low to RV's minimum support value
WARNING(PlotDist): High value provided by user, 40
is greater than maximum support value of the random

variable, $\frac{e+e^{-1}}{e-e^{-1}}$

Resetting high to RV's maximum support value

WARNING(PlotDist): Low value provided by user, 0

is less than minimum support value of random variable

1

Resetting low to RV's minimum support value

WARNING(PlotDist): High value provided by user, 40

is greater than maximum support value of the random

variable, $\frac{e+e^{-1}}{e-e^{-1}}$

Resetting high to RV's maximum support value

```
1/2\,{\frac {3\,{{\rm e}^{3-3\,{\rm arctanh} \left({x}^{-1}
\right)}}+4
\,{{\rm e}^{4-4\,{\rm arctanh} \left({x}^{-1}\right)}}}{{x}^{2}
-1}}
```

"i is", 17,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\ \frac{3\,e^{3-3\,\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)}+4\,e^{4-4\,\operatorname{arcsinh}\left(\frac{1}{y\sim}\right)}}{\sqrt{y\sim^2+1}\ |y\sim|}\right], \left[0,\ \frac{2}{e-e^{-1}}\right], \left["\text{Continuous}",\ "\text{PDF}"\right]\right]$$

"l and u", 0, ∞

"g(x)", $\frac{1}{\sinh(x+1)}$, "base", $\frac{3}{2}\ e^{-3x}+2\,e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\ \frac{3\,e^{3-3\,\operatorname{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\operatorname{arcsinh}\left(\frac{1}{x}\right)}}{\sqrt{x^2+1}\ |x|}$

"F(x)", $\frac{1}{2}\ \frac{x^3\,e^3\left(e\,x+\sqrt{x^2+1}+1\right)}{x^4+8\,x^2+8+4\sqrt{x^2+1}\ x^2+8\sqrt{x^2+1}}$

"IDF(x)", $\left[\left[s \to RootOf\left(\left(e^8-4\,e^4\,s-e^6+4\,s^2\right)\_Z^4+\left(2\,e^7+12\,e^3\,s\right)\_Z^3-32\,e^4\,s\,\_Z^2+16\,e^3\,s\,\_Z-32\,e^4\,s\right)\right]\right]$, $[0,\ 1]$, ["Continuous", "IDF"]]

"S(x)", $-\frac{1}{2}\,\frac{e^4 x^4+\sqrt{x^2+1}\,e^3 x^3+e^3 x^3-2x^4-8\sqrt{x^2+1}\,x^2-16x^2-16\sqrt{x^2+1}-16}{x^4+8x^2+8+4\sqrt{x^2+1}\,x^2+8\sqrt{x^2+1}}$

"h(x)", $-\left(\left(3\,e^{3-3\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}\right)\left(x^4+8x^2+8+4\sqrt{x^2+1}\,x^2+8\sqrt{x^2+1}\right)\right)\Big/\left(\sqrt{x^2+1}\,|x|\left(e^4 x^4+\sqrt{x^2+1}\,e^3 x^3+e^3 x^3-2x^4-8\sqrt{x^2+1}\,x^2-16x^2-16\sqrt{x^2+1}-16\right)\right)$

"mean and variance", $\frac{1}{2}\int_0^{\frac{2e}{e^2-1}}\frac{3\,e^{3-3\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}}{\sqrt{x^2+1}}\,dx$, $\frac{1}{2}\int_0^{\frac{2e}{e^2-1}}\frac{x\left(3\,e^{3-3\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}\right)}{\sqrt{x^2+1}}\,dx$

$-\frac{1}{4}\left(\int_0^{\frac{2e}{e^2-1}}\frac{3\,e^{3-3\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}}{\sqrt{x^2+1}}\,dx\right)^2$

"MF", $\int_0^{\frac{2}{e-e^{-1}}}\frac{1}{2}\,\frac{x^{t\sim}\left(3\,e^{3-3\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}\right)}{\sqrt{x^2+1}\,|x|}\,dx$

"MGF", $\frac{1}{2}\int_0^{\frac{2e}{e^2-1}}\frac{e^{tx}\left(3\,e^{3-3\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}+4\,e^{4-4\,\mathrm{arcsinh}\left(\frac{1}{x}\right)}\right)}{\sqrt{x^2+1}\,x}\,dx$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable,* $\frac{2}{e-e^{-1}}$

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random*

variable, $\frac{2}{e - e^{-1}}$

Resetting high to RV's maximum support value

```
1/2\,{\frac {3\,{{\rm e}^{3-3\,{\rm arcsinh} \left({x}^{-1}
\right)}}+4
\,{{\rm e}^{4-4\,{\rm arcsinh} \left({x}^{-1}\right)}}}{\sqrt {
{x}^{2}
+1} \left| x \right| }}
```

"i is", 18,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\ \frac{\left(3\,e^{3-3\sinh\left(\frac{1}{y\sim}\right)} + 4\,e^{4-4\sinh\left(\frac{1}{y\sim}\right)}\right)\cosh\left(\frac{1}{y\sim}\right)}{y\sim^2}\right], \left[0, \frac{1}{\ln\left(1+\sqrt{2}\right)}\right], \right.$$

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

"l and u", 0, ∞

"g(x)", $\frac{1}{\operatorname{arcsinh}(x+1)}$, "base", $\frac{3}{2}\,e^{-3x} + 2\,e^{-4x}$, "HyperExponentialRV([1/2,1/2],[3,4])"

"f(x)", $\frac{1}{2}\ \frac{\left(3\,e^{3-3\sinh\left(\frac{1}{x}\right)} + 4\,e^{4-4\sinh\left(\frac{1}{x}\right)}\right)\cosh\left(\frac{1}{x}\right)}{x^2}$

"F(x)", $\frac{1}{2}\left(e^{\frac{1}{2}\left(4e^{\frac{2}{x}} + 6e^{\frac{1}{x}} + 3\right)e^{-\frac{1}{x}}} + e^{\frac{1}{2}\left(3e^{\frac{2}{x}} + 8e^{\frac{1}{x}} + 4\right)e^{-\frac{1}{x}}}\right)e^{-\frac{7}{2}e^{\frac{1}{x}}}$

"IDF(x)", $\left[\left[s \to 1\Big/\left(\ln\left(\ln\left(RootOf\left(2\_Z^4 s - \_Z - 1\right)\right)\right) + 1 + \sqrt{\ln\left(RootOf\left(2\_Z^4 s - \_Z - 1\right)\right)^2 + 2\ln\left(RootOf\left(2\_Z^4 s - \_Z - 1\right)\right) + 2}\right)\right)\right]$, [0, 1], ["Continuous", "IDF"]$\left.\right]$

"S(x)", $1 - \frac{1}{2}\,e^{-\frac{3}{2}\left(e^{\frac{2}{x}} - 2e^{\frac{1}{x}} - 1\right)e^{-\frac{1}{x}}} - \frac{1}{2}\,e^{-2\left(e^{\frac{2}{x}} - 2e^{\frac{1}{x}} - 1\right)e^{-\frac{1}{x}}}$

$$\text{"h(x)"},\ -\frac{\left(3\,e^{3-3\sinh\left(\frac{1}{x}\right)}+4\,e^{4-4\sinh\left(\frac{1}{x}\right)}\right)\cosh\left(\frac{1}{x}\right)}{x^2\left(-2+e^{\frac{3}{2}\left(-e^{\frac{2}{x}}+2e^{\frac{1}{x}}+1\right)e^{-\frac{1}{x}}}+e^{2\left(-e^{\frac{2}{x}}+2e^{\frac{1}{x}}+1\right)e^{-\frac{1}{x}}}\right)}$$

"i is", 19,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2}\ \frac{3\,y\sim+1+3\sqrt{y\sim^2-2\,y\sim+2}}{\left(y\sim-1+\sqrt{y\sim^2-2\,y\sim+2}\right)^4\sqrt{y\sim^2-2\,y\sim+2}}\right],\ [1,\ \infty],\ [\text{"Continuous"},\ \text{"PDF"}]\right]$$

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

$$\text{"g(x)"},\ \frac{1}{\operatorname{csch}(x)}+1,\ \text{"base"},\ \frac{3}{2}\,e^{-3x}+2\,e^{-4x},\ \text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"},\ \frac{1}{2}\ \frac{3\,x+1+3\sqrt{x^2-2\,x+2}}{\left(x-1+\sqrt{x^2-2\,x+2}\right)^4\sqrt{x^2-2\,x+2}}$$

$$\text{"F(x)"},\ -11-34\,x^2+18\,x^3-4\,x^4+\frac{63}{2}\,x+18\sqrt{x^2-2\,x+2}\,x-\frac{17}{2}\sqrt{x^2-2\,x+2}-14\sqrt{x^2-2\,x+2}\,x^2+4\sqrt{x^2-2\,x+2}\,x^3$$

$$\text{"IDF(x)"},\ [[s\to RootOf((16\,s-16)\_Z^4+(-72\,s+72)\_Z^3+(136\,s-136)\_Z^2+(-126\,s+127)\_Z+2\,s^2+44\,s-47)],\ [0,\ 1],\ [\text{"Continuous"},\ \text{"IDF"}]]$$

$$\text{"S(x)"},\ 12+34\,x^2-18\,x^3+4\,x^4-\frac{63}{2}\,x-18\sqrt{x^2-2\,x+2}\,x+\frac{17}{2}\sqrt{x^2-2\,x+2}+14\sqrt{x^2-2\,x+2}\,x^2-4\sqrt{x^2-2\,x+2}\,x^3$$

$$\text{"h(x)"},\ -\left(3\,x+1+3\sqrt{x^2-2\,x+2}\right)\Big/\left(\left(x-1+\sqrt{x^2-2\,x+2}\right)^4\sqrt{x^2-2\,x+2}\left(8\sqrt{x^2-2\,x+2}\,x^3-8\,x^4-28\sqrt{x^2-2\,x+2}\,x^2+36\,x^3+36\sqrt{x^2-2\,x+2}\,x-68\,x^2-17\sqrt{x^2-2\,x+2}+63\,x-24\right)\right)$$

$$\text{"mean and variance"},\ \frac{317}{240},\ \frac{10391}{57600}$$

$$\text{"MF"}, \int_1^{\infty} \frac{1}{2} \frac{x^{r\sim}\left(3x+1+3\sqrt{x^2-2x+2}\right)}{\left(x-1+\sqrt{x^2-2x+2}\right)^4 \sqrt{x^2-2x+2}}\, dx$$

$$\text{"MGF"}, \int_1^{\infty} \frac{1}{2} \frac{e^{tx}\left(3x+1+3\sqrt{x^2-2x+2}\right)}{\left(x-1+\sqrt{x^2-2x+2}\right)^4 \sqrt{x^2-2x+2}}\, dx$$

WARNING(PlotDist): Low value provided by user, 0
is less than minimum support value of random variable
1
Resetting low to RV's minimum support value
WARNING(PlotDist): Low value provided by user, 0
is less than minimum support value of random variable
1
Resetting low to RV's minimum support value

```
1/2\,{\frac {3\,x+1+3\,\sqrt {{x}^{2}-2\,x+2}}{ \left( x-1+\sqrt {{x}^
{2}-2\,x+2} \right) ^{4}\sqrt {{x}^{2}-2\,x+2}}}
```

"i is", 20,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to -\frac{1}{2} \frac{e^{-\frac{3}{\operatorname{arctanh}(y\sim)}}\left(3+4\,e^{-\frac{1}{\operatorname{arctanh}(y\sim)}}\right)}{\operatorname{arctanh}(y\sim)^2\left(y\sim^2-1\right)}\right], [0, 1], [\text{"Continuous"}, \text{"PDF"}]\right]$$

"l and u", 0, ∞

$$\text{"g(x)"}, \tanh\left(\frac{1}{x}\right), \text{"base"}, \frac{3}{2}e^{-3x}+2e^{-4x}, \text{"HyperExponentialRV([1/2,1/2],[3,4])"}$$

$$\text{"f(x)"}, -\frac{1}{2} \frac{e^{-\frac{3}{\operatorname{arctanh}(x)}}\left(3+4\,e^{-\frac{1}{\operatorname{arctanh}(x)}}\right)}{\operatorname{arctanh}(x)^2\left(x^2-1\right)}$$

$$\text{"F(x)"}, \frac{1}{2}\left(e^{\frac{2}{\ln(x+1)-\ln(1-x)}}+1\right)e^{-\frac{8}{\ln(x+1)-\ln(1-x)}}$$

$$\text{"IDF(x)"}, \left[\left[s \to \frac{e^{\frac{2}{\ln(RootOf(2\_Z^4 s-\_Z-1))}}-1}{e^{\frac{2}{\ln(RootOf(2\_Z^4 s-\_Z-1))}}+1}\right], [0, 1], [\text{"Continuous"}, \text{"IDF"}]\right]$$

$$\text{"S(x)"}, \frac{1}{2}\left(2e^{\frac{8}{\ln(x+1)-\ln(1-x)}}-e^{\frac{2}{\ln(x+1)-\ln(1-x)}}-1\right)e^{-\frac{8}{\ln(x+1)-\ln(1-x)}}$$

$$\text{"h(x)"},\ -\frac{e^{\frac{-3\ln(x+1)+3\ln(1-x)+8\,\text{arctanh}(x)}{\text{arctanh}(x)\,(\ln(x+1)-\ln(1-x))}}\left(3+4\,e^{-\frac{1}{\text{arctanh}(x)}}\right)}{\text{arctanh}(x)^2\left(x^2-1\right)\left(2\,e^{\frac{8}{\ln(x+1)-\ln(1-x)}}-e^{\frac{2}{\ln(x+1)-\ln(1-x)}}-1\right)}$$

$$\text{"mean and variance"},\ -\frac{1}{2}\int_0^1 \frac{x\,e^{-\frac{3}{\text{arctanh}(x)}}\left(3+4\,e^{-\frac{1}{\text{arctanh}(x)}}\right)}{\text{arctanh}(x)^2\left(x^2-1\right)}\,dx,\ -\frac{1}{2}$$

$$\int_0^1 \frac{x^2\,e^{-\frac{3}{\text{arctanh}(x)}}\left(3+4\,e^{-\frac{1}{\text{arctanh}(x)}}\right)}{\text{arctanh}(x)^2\left(x^2-1\right)}\,dx-\frac{1}{4}\left(\int_0^1 \frac{x\,e^{-\frac{3}{\text{arctanh}(x)}}\left(3+4\,e^{-\frac{1}{\text{arctanh}(x)}}\right)}{\text{arctanh}(x)^2\left(x^2-1\right)}\,dx\right)^2$$

$$\text{"MF"},\int_0^1 \left(-\frac{1}{2}\,\frac{x^{r\sim}\,e^{-\frac{3}{\text{arctanh}(x)}}\left(3+4\,e^{-\frac{1}{\text{arctanh}(x)}}\right)}{\text{arctanh}(x)^2\left(x^2-1\right)}\right)dx$$

$$\text{"MGF"},\ -\frac{1}{2}\int_0^1 \frac{\left(3+4\,e^{-\frac{1}{\text{arctanh}(x)}}\right)e^{\frac{t\,x\,\text{arctanh}(x)-3}{\text{arctanh}(x)}}}{\text{arctanh}(x)^2\left(x^2-1\right)}\,dx$$

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, 1

Resetting high to RV's maximum support value

WARNING(PlotDist): High value provided by user, 40 *is greater than maximum support value of the random variable*, 1

Resetting high to RV's maximum support value

```
-1/2\,{\frac {1}{ \left( {\rm arctanh} \left(x\right) \right) ^
{2}
 \left( {x}^{2}-1 \right) }{{\rm e}^{-3\, \left( {\rm arctanh}
\left(x
\right) \right) ^{-1}}} \left( 3+4\,{{\rm e}^{- \left( {\rm
arctanh}
\left(x\right) \right) ^{-1}}} \right) }
```

"i is", 21,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \left[\left[y\sim \to \frac{1}{2} \, \frac{e^{-\frac{3}{\operatorname{arccsch}(y\sim)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(y\sim)}} + 3 \right)}{\sqrt{y\sim^2 + 1}\ \operatorname{arccsch}(y\sim)^2\, |y\sim|} \right], [0,\ \infty], ["\text{Continuous}", "\text{PDF}"] \right]$$

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

$$"\text{g(x)}",\ \operatorname{csch}\left(\frac{1}{x} \right),\ "\text{base}",\ \frac{3}{2}\, e^{-3x} + 2\, e^{-4x},\ "\text{HyperExponentialRV([1/2,1/2],[3,4])}"$$

$$"\text{f(x)}",\ \frac{1}{2} \, \frac{e^{-\frac{3}{\operatorname{arccsch}(x)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3 \right)}{\sqrt{x^2 + 1}\ \operatorname{arccsch}(x)^2\, |x|}$$

$$"\text{F(x)}",\ \frac{1}{2} \int_0^x \frac{e^{-\frac{3}{\operatorname{arccsch}(t)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(t)}} + 3 \right)}{\sqrt{t^2 + 1}\ \operatorname{arccsch}(t)^2\, |t|}\, dt$$

$$"\text{S(x)}",\ 1 - \frac{1}{2} \int_0^x \frac{e^{-\frac{3}{\operatorname{arccsch}(t)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(t)}} + 3 \right)}{\sqrt{t^2 + 1}\ \operatorname{arccsch}(t)^2\, |t|}\, dt$$

$$"\text{h(x)}",\ -\frac{e^{-\frac{3}{\operatorname{arccsch}(x)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3 \right)}{\sqrt{x^2 + 1}\ \operatorname{arccsch}(x)^2\, |x| \left(-2 + \int_0^x \frac{e^{-\frac{3}{\operatorname{arccsch}(t)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(t)}} + 3 \right)}{\sqrt{t^2 + 1}\ \operatorname{arccsch}(t)^2\, |t|}\, dt \right)}$$

$$"\text{mean and variance}",\ \int_0^\infty \frac{1}{2} \, \frac{e^{-\frac{3}{\operatorname{arccsch}(x)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3 \right)}{\sqrt{x^2 + 1}\ \operatorname{arccsch}(x)^2}\, dx,$$

$$\int_0^\infty \frac{1}{2} \, \frac{x\, e^{-\frac{3}{\operatorname{arccsch}(x)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3 \right)}{\sqrt{x^2 + 1}\ \operatorname{arccsch}(x)^2}\, dx - \left(\int_0^\infty \frac{1}{2} \, \frac{e^{-\frac{3}{\operatorname{arccsch}(x)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3 \right)}{\sqrt{x^2 + 1}\ \operatorname{arccsch}(x)^2}\, dx \right)^2$$

$$"\text{MF}",\ \int_0^\infty \frac{1}{2} \, \frac{x\sim^r\, e^{-\frac{3}{\operatorname{arccsch}(x)}} \left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3 \right)}{\sqrt{x^2 + 1}\ \operatorname{arccsch}(x)^2\, |x|}\, dx$$

$$\text{"MGF"}, \int_0^{\infty} \frac{1}{2} \, \frac{\left(4\, e^{-\frac{1}{\operatorname{arccsch}(x)}} + 3\right) e^{\frac{t\,x\operatorname{arccsch}(x) - 3}{\operatorname{arccsch}(x)}}}{\sqrt{x^2+1}\ \operatorname{arccsch}(x)^2\, x} \, dx$$

Warning, computation interrupted