

```
> 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, $n \geq r$
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 := ArcTanRV(2,3);
bfname := "ArcTanRV(2,3)";
bf := 
$$\left[ x \rightarrow \frac{2}{\left( \arctan(6) + \frac{1}{2} \pi \right) (1 + 4(x-3)^2)} \right], [0, \infty], ["Continuous", "PDF"]$$

bfname := "ArcTanRV(2,3)"
(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)
(2)

```

```

> # discarded -ln(t + 1), t-> csch(t), t->arccsch(t), t -> tan(t),
> #name of the file for latex output
filename := "C:/LatexOutput/ArcTan.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, " -----
-----");
if i < 15 or i > 15 then

    g := glist[i];
    l := 0;
    u := infinity;
    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));
    if i <> 14 and i <> 17 then
        print("F(x)", CDF(Temp, x));
        if i <> 17 and i <> 19 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 <> 22 then
            if i <> 13 then
                print("mean and variance", Mean(Temp), Variance(Temp));
            end if;
            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 i <> 21 then
                PlotDist(PDF(Temp), 0, 40);
                PlotDist(HF(Temp), 0, 40);
            end if;
            end if;
            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("$$");
if i <>14 and i <> 17 then
printf("Cumulative Distribution Function \n $$F(x)=");
latex(CDF(Temp,x));
printf("$$");
printf(" Inverse Cumulative Distribution Function \n ");
printf(" $$F^{-1} = ");
if i <> 17 and i <>19 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("$$");
if i <> 22 then
if i <>13 then
printf("Mean \n $$ \mu=");
latex(Mean(Temp));
printf("$$ Variance \n $$ \sigma^2 = ");
latex(Variance(Temp));
printf("$$");
end if;
printf("Moment Function \n $$ m(x) = ");
latex(mf);
printf("$$ Moment Generating Function \n $$");
latex(MGF(Temp)[1]);
printf("$$");
end if;
#latex(MGF(Temp)[1]);
end if;

writeto(terminal);

end if;

od;

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

```

filename := "C:/LatexOutput/ArcTan.tex"

$$\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$$

"i is", 1,

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

```

                                "l and u", 0, ∞
    "g(x)", x^2, "base",  $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$ , "ArcTanRV(2,3)"

    "f(x)", -  $\frac{2}{(2 \arctan(6) + \pi) (-4 x + 24 \sqrt{x} - 37) \sqrt{x}}$ 

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

    "IDF(x)",  $\left[ \left[ s \rightarrow 9 + 3 \tan\left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6)\right) + \frac{1}{4} \tan\left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6)\right)^2 \right], [0, 1], ["Continuous", "IDF"] \right]$ 

    "S(x)", -  $\frac{-\pi + 2 \arctan(-6 + 2 \sqrt{x})}{2 \arctan(6) + \pi}$ 

    "h(x)", -  $\frac{2}{(-4 x + 24 \sqrt{x} - 37) \sqrt{x} (\pi - 2 \arctan(-6 + 2 \sqrt{x}))}$ 
                                "mean and variance", ∞, undefined

    "MF",  $\int_0^\infty \left( - \frac{2 x'^{\sim}}{(2 \arctan(6) + \pi) (-4 x + 24 \sqrt{x} - 37) \sqrt{x}} \right) dx$ 

    "MGF",  $\int_0^\infty \left( - \frac{2 e^{tx}}{(2 \arctan(6) + \pi) (-4 x + 24 \sqrt{x} - 37) \sqrt{x}} \right) dx$ 
-2\,{\frac {1}{\left( 2\,\arctan \left( 6 \right) +\pi \right) \left( -4\,x+24\,\sqrt{x}-37 \right) \sqrt{x}}}}
    "i is", 2,
    " -----
    -----"

                                "l and u", 0, ∞
    "g(x)",  $\sqrt{x}$ , "base",  $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$ , "ArcTanRV(2,3)"

    "f(x)",  $\frac{8 x}{(2 \arctan(6) + \pi) (4 x^4 - 24 x^2 + 37)}$ 

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

    "IDF(x)",  $\left[ \left[ s \rightarrow \frac{1}{2} \sqrt{12 + 2 \tan\left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6)\right)} \right], [0, 1], ["Continuous", "IDF"] \right]$ 

```

"S(x)", $\frac{\pi - 2 \arctan(2 x^2 - 6)}{2 \arctan(6) + \pi}$

"h(x)", $\frac{8 x}{(4 x^4 - 24 x^2 + 37) (\pi - 2 \arctan(2 x^2 - 6))}$

"mean and variance", $\frac{\pi}{(2 \arctan(6) + \pi) \sqrt{-6 + \sqrt{37}}}, \infty$

"MF", $\int_0^{\infty} \frac{8 x'^{\sim} x}{(2 \arctan(6) + \pi) (4 x^4 - 24 x^2 + 37)} dx$

"MGF", $\lim_{x \rightarrow \infty} \left(-\frac{1}{2 \arctan(6) + \pi} \left(I \left(e^{-\frac{1}{2} \sqrt{12+2I} t} \operatorname{Ei} \left(1, -\frac{1}{2} \sqrt{12+2I} t \right) \right. \right. \right.$
 $- e^{-\frac{1}{2} \sqrt{12+2I} t} \operatorname{Ei} \left(1, -t x - \frac{1}{2} \sqrt{12+2I} t \right) - e^{\frac{1}{2} \sqrt{12-2I} t} \operatorname{Ei} \left(1, \frac{1}{2} \sqrt{12-2I} t \right)$
 $+ e^{\frac{1}{2} \sqrt{12-2I} t} \operatorname{Ei} \left(1, -t x + \frac{1}{2} \sqrt{12-2I} t \right) - e^{-\frac{1}{2} \sqrt{12-2I} t} \operatorname{Ei} \left(1, -\frac{1}{2} \sqrt{12-2I} t \right)$
 $+ e^{-\frac{1}{2} \sqrt{12-2I} t} \operatorname{Ei} \left(1, -t x - \frac{1}{2} \sqrt{12-2I} t \right) + e^{\frac{1}{2} \sqrt{12+2I} t} \operatorname{Ei} \left(1, \frac{1}{2} \sqrt{12+2I} t \right)$
 $\left. \left. \left. - e^{\frac{1}{2} \sqrt{12+2I} t} \operatorname{Ei} \left(1, -t x + \frac{1}{2} \sqrt{12+2I} t \right) \right) \right) \right)$

8\,,{\frac {x}{\left(2\,,\arctan \left(6 \right) +\pi \right) \left(4\,,{x}^{4}-24\,,{x}^{2}+37 \right) }}

"i is", 3,

"-----"

-----"

"l and u", 0, ∞

"g(x)", $\frac{1}{x}$, "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"

"f(x)", $\frac{4}{(2 \arctan(6) + \pi) (37 x^2 - 24 x + 4)}$

"F(x)", $\frac{2 \left(\arctan(6) + \arctan \left(\frac{37}{2} x - 6 \right) \right)}{2 \arctan(6) + \pi}$

"IDF(x)", $\left[\left[s \rightarrow \frac{12}{37} + \frac{2}{37} \tan \left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6) \right) \right], [0, 1], ["Continuous", "IDF"] \right]$

$$\text{"S(x)", } \frac{\pi - 2 \arctan\left(\frac{37}{2} x - 6\right)}{2 \arctan(6) + \pi}$$

$$\text{"h(x)", } \frac{4}{(37 x^2 - 24 x + 4) \left(\pi - 2 \arctan\left(\frac{37}{2} x - 6\right)\right)}$$

"mean and variance", ∞ , *undefined*

$$\text{"MF", } \int_0^{\infty} \frac{4 x^{\sim}}{(2 \arctan(6) + \pi) (37 x^2 - 24 x + 4)} dx$$

$$\begin{aligned} \text{"MGF", } \lim_{x \rightarrow \infty} \frac{1}{2 \arctan(6) + \pi} & \left(I \left(e^{\left(\frac{12}{37} + \frac{2}{37} I\right) t} \operatorname{Ei} \left(1, -t x + \frac{12}{37} t + \frac{2}{37} I t \right) \right. \right. \\ & - e^{\left(\frac{12}{37} - \frac{2}{37} I\right) t} \operatorname{Ei} \left(1, -t x + \frac{12}{37} t - \frac{2}{37} I t \right) - \operatorname{Ei} \left(1, \frac{12}{37} t + \frac{2}{37} I t \right) e^{\left(\frac{12}{37} + \frac{2}{37} I\right) t} \\ & \left. \left. + \operatorname{Ei} \left(1, \frac{12}{37} t - \frac{2}{37} I t \right) e^{\left(\frac{12}{37} - \frac{2}{37} I\right) t} \right) \right) \end{aligned}$$

$$4 \backslash, \left\{ \frac{1}{\left(2 \backslash, \arctan \left(6 \right) + \pi \right) \left(37 \backslash, {x}^2 - 24 \backslash, x + 4 \right) } \right\}$$

"i is", 4,

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

"l and u", 0, ∞

$$\text{"g(x)", } \arctan(x), \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } - \frac{4}{(2 \arctan(6) + \pi) (24 \sin(x) \cos(x) - 33 \cos(x)^2 - 4)}$$

"F(x)",

$$\left\{ \begin{array}{ll} \frac{2 \arctan(6) + 2 \arctan(-6 + 2 \tan(x))}{2 \arctan(6) + \pi} & x \leq \frac{1}{2} \pi \\ \frac{2 \left(\pi \operatorname{floor} \left(-\frac{1}{2} \frac{-2 x + \pi}{\pi} \right) + \arctan(6) + \pi + \arctan(-6 + 2 \tan(x)) \right)}{2 \arctan(6) + \pi} & \frac{1}{2} \pi < x \end{array} \right.$$

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

$$\text{"S(x)", } \left\{ \begin{array}{ll} \frac{\pi - 2 \arctan(-6 + 2 \tan(x))}{2 \arctan(6) + \pi} & x \leq \frac{1}{2} \pi \\ - \frac{2 \pi \operatorname{floor} \left(-\frac{1}{2} \frac{-2 x + \pi}{\pi} \right) + \pi + 2 \arctan(-6 + 2 \tan(x))}{2 \arctan(6) + \pi} & \frac{1}{2} \pi < x \end{array} \right.$$

$$\text{"h(x)", } \left\{ \begin{array}{l} \frac{4}{(24 \sin(x) \cos(x) - 33 \cos(x)^2 - 4) \left(-\pi + 2 \arctan\left(\frac{2(-3 \cos(x) + \sin(x))}{\cos(x)}\right) \right)} \\ \frac{4}{(24 \sin(x) \cos(x) - 33 \cos(x)^2 - 4) \left(2 \pi \operatorname{floor}\left(-\frac{1}{2} \frac{-2x + \pi}{\pi}\right) + \pi + 2 \arctan\left(\frac{2(-3 \cos(x) + \sin(x))}{\cos(x)}\right) \right)} \end{array} \right.$$

$$\begin{aligned} \text{"mean and variance", } & \frac{1}{4} \frac{1}{2 \arctan(6) + \pi} \left(2 I \pi \ln(3) + I \pi \ln(5) - 2 I \pi \ln(1 - 6 I) \right. \\ & + 4 \arctan(6) \pi + 6 \pi \arctan(2) + 2 \operatorname{dilog}\left(\frac{4}{15} - \frac{8}{15} I\right) - 2 \operatorname{dilog}\left(\frac{4}{37} - \frac{24}{37} I\right) \\ & - 2 \operatorname{dilog}\left(\frac{26}{15} + \frac{8}{15} I\right) + 2 \operatorname{dilog}\left(\frac{70}{37} + \frac{24}{37} I\right) \Big), \frac{1}{16} \frac{1}{(2 \arctan(6) + \pi)^2} \left(\right. \\ & - 16 \ln\left(\left(-\frac{33}{37} - \frac{24}{37} I\right) e^{I(\arctan(6) + \arctan(2))}\right)^2 \pi \arctan(6) - 16 I \pi^3 \ln\left(\left(-\frac{33}{37} \right. \right. \\ & \left. \left. - \frac{24}{37} I\right) e^{I(\arctan(6) + \arctan(2))}\right) - 8 I \pi^3 \ln\left(e^{-2 I(\arctan(6) + \arctan(2))} \sqrt{-35733 - 12156 I}\right) \\ & + 8 I \operatorname{polylog}\left(3, \frac{11}{15} + \frac{8}{15} I\right) \pi - 16 I \operatorname{polylog}\left(3, \frac{33}{37} + \frac{24}{37} I\right) \arctan(6) \\ & - 8 I \operatorname{polylog}\left(3, \frac{33}{37} + \frac{24}{37} I\right) \pi + 4 \ln(3) \ln(5) \pi^2 - 8 \ln(3) \pi^2 \ln(1 - 6 I) \\ & - 4 \ln(5) \pi^2 \ln(1 - 6 I) - 48 \arctan(6) \pi^2 \arctan(2) + 16 \pi \operatorname{polylog}\left(2, \frac{11}{15} \right. \\ & \left. + \frac{8}{15} I\right) \arctan(6) - 16 \pi \operatorname{polylog}\left(2, \frac{33}{37} + \frac{24}{37} I\right) \arctan(6) \\ & - 16 \arctan(6) \pi \operatorname{dilog}\left(\frac{4}{15} - \frac{8}{15} I\right) + 16 \arctan(6) \pi \operatorname{dilog}\left(\frac{4}{37} - \frac{24}{37} I\right) \\ & + 16 \arctan(6) \pi \operatorname{dilog}\left(\frac{26}{15} + \frac{8}{15} I\right) - 16 \arctan(6) \pi \operatorname{dilog}\left(\frac{70}{37} + \frac{24}{37} I\right) \\ & - 24 \pi \operatorname{dilog}\left(\frac{4}{15} - \frac{8}{15} I\right) \arctan(2) + 24 \pi \operatorname{dilog}\left(\frac{4}{37} - \frac{24}{37} I\right) \arctan(2) \\ & + 24 \pi \operatorname{dilog}\left(\frac{26}{15} + \frac{8}{15} I\right) \arctan(2) - 24 \pi \operatorname{dilog}\left(\frac{70}{37} + \frac{24}{37} I\right) \arctan(2) \\ & + 16 I \pi^3 \ln(3) + 16 I \pi^3 \ln(5) + 16 I \operatorname{polylog}\left(3, -\frac{33}{37} - \frac{24}{37} I\right) \arctan(6) \\ & + 8 I \operatorname{polylog}\left(3, -\frac{33}{37} - \frac{24}{37} I\right) \pi - 16 I \operatorname{polylog}\left(3, -\frac{11}{15} - \frac{8}{15} I\right) \arctan(6) \\ & \left. - 8 I \operatorname{polylog}\left(3, -\frac{11}{15} - \frac{8}{15} I\right) \pi + 16 I \operatorname{polylog}\left(3, \frac{11}{15} + \frac{8}{15} I\right) \arctan(6) \right) \end{aligned}$$

$$\begin{aligned}
& + 32 I \pi \ln \left(\left(-\frac{33}{37} - \frac{24}{37} I \right) e^{I(\arctan(6) + \arctan(2))} \right) \arctan(2) \arctan(6) \\
& - 4 \operatorname{dilog} \left(\frac{4}{15} - \frac{8}{15} I \right)^2 - 4 \operatorname{dilog} \left(\frac{4}{37} - \frac{24}{37} I \right)^2 - 4 \operatorname{dilog} \left(\frac{26}{15} + \frac{8}{15} I \right)^2 \\
& - 4 \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right)^2 + \ln(5)^2 \pi^2 - 16 \arctan(6)^2 \pi^2 + 4 \pi^2 \ln(1 - 6 I)^2 \\
& - 36 \pi^2 \arctan(2)^2 + 8 \pi^2 \operatorname{polylog} \left(2, \frac{11}{15} + \frac{8}{15} I \right) - 8 \pi^2 \operatorname{polylog} \left(2, \frac{33}{37} + \frac{24}{37} I \right) \\
& + 8 \operatorname{dilog} \left(\frac{4}{15} - \frac{8}{15} I \right) \operatorname{dilog} \left(\frac{4}{37} - \frac{24}{37} I \right) + 8 \operatorname{dilog} \left(\frac{4}{15} - \frac{8}{15} I \right) \operatorname{dilog} \left(\frac{26}{15} \right. \\
& + \left. \frac{8}{15} I \right) - 8 \operatorname{dilog} \left(\frac{4}{15} - \frac{8}{15} I \right) \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right) - 8 \operatorname{dilog} \left(\frac{4}{37} \right. \\
& - \left. \frac{24}{37} I \right) \operatorname{dilog} \left(\frac{26}{15} + \frac{8}{15} I \right) + 8 \operatorname{dilog} \left(\frac{4}{37} - \frac{24}{37} I \right) \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right) \\
& + 8 \operatorname{dilog} \left(\frac{26}{15} + \frac{8}{15} I \right) \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right) + 16 I \ln(3) \arctan(6) \pi^2 \\
& - 24 I \ln(3) \pi^2 \arctan(2) + 24 I \ln(5) \arctan(6) \pi^2 - 12 I \ln(5) \pi^2 \arctan(2) \\
& + 16 I \arctan(6) \pi^2 \ln(1 - 6 I) + 24 I \pi^2 \ln(1 - 6 I) \arctan(2) - 8 I \ln(3) \pi \operatorname{dilog} \left(\frac{4}{15} \right. \\
& - \left. \frac{8}{15} I \right) + 8 I \ln(3) \pi \operatorname{dilog} \left(\frac{4}{37} - \frac{24}{37} I \right) + 8 I \ln(3) \pi \operatorname{dilog} \left(\frac{26}{15} + \frac{8}{15} I \right) \\
& - 8 I \ln(3) \pi \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right) - 4 I \ln(5) \pi \operatorname{dilog} \left(\frac{4}{15} - \frac{8}{15} I \right) \\
& + 4 I \ln(5) \pi \operatorname{dilog} \left(\frac{4}{37} - \frac{24}{37} I \right) + 4 I \ln(5) \pi \operatorname{dilog} \left(\frac{26}{15} + \frac{8}{15} I \right) \\
& - 4 I \ln(5) \pi \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right) + 8 I \pi \ln(1 - 6 I) \operatorname{dilog} \left(\frac{4}{15} - \frac{8}{15} I \right) - 8 I \pi \ln(1 \\
& - 6 I) \operatorname{dilog} \left(\frac{4}{37} - \frac{24}{37} I \right) - 8 I \pi \ln(1 - 6 I) \operatorname{dilog} \left(\frac{26}{15} + \frac{8}{15} I \right) + 8 I \pi \ln(1 \\
& - 6 I) \operatorname{dilog} \left(\frac{70}{37} + \frac{24}{37} I \right) - 8 \ln \left(\left(-\frac{33}{37} - \frac{24}{37} I \right) e^{I(\arctan(6) + \arctan(2))} \right)^2 \pi^2 \\
& + 32 I \pi \ln \left(\left(-\frac{33}{37} - \frac{24}{37} I \right) e^{I(\arctan(6) + \arctan(2))} \right) \arctan(6)^2 - 16 I \pi^2 \ln \left(\left(-\frac{33}{37} \right. \right. \\
& - \left. \left. \frac{24}{37} I \right) e^{I(\arctan(6) + \arctan(2))} \right) \arctan(6) \\
& - 16 I \pi^2 \ln \left(e^{-2 I(\arctan(6) + \arctan(2))} \sqrt{-35733 - 12156 I} \right) \arctan(6) + 16 I \pi^2 \ln \left(\left(-\frac{33}{37} \right. \right. \\
& - \left. \left. \frac{24}{37} I \right) e^{I(\arctan(6) + \arctan(2))} \right) \arctan(2) + 4 \pi^2 \ln(3)^2 \Big)
\end{aligned}$$

```

"MF", \int_0^{\frac{1}{2} \pi} \left( - \frac{4 x^{\sim}}{(2 \arctan(6) + \pi) (24 \sin(x) \cos(x) - 33 \cos(x)^2 - 4)} \right) dx

"MGF", - \frac{8 \left( \int_0^{\frac{1}{2} \pi} \frac{e^{tx}}{24 \sin(2 x) - 33 \cos(2 x) - 41} dx \right)}{2 \arctan(6) + \pi}

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
-4\,{\frac {1}{\left( 2\,\arctan \left( 6 \right) +\pi \right)
\left( 24\,\sin \left( x \right) \cos \left( x \right) -33\,
\left(
\cos \left( x \right) \right) ^{2}-4 \right) }}}
"i is", 5,
" -----
-----"

"l and u", 0, \infty

"g(x)", e^x, "base", \frac{2}{\left( \arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}, "ArcTanRV(2,3)"

"f(x)", \frac{4}{(2 \arctan(6) + \pi) (4 \ln(x)^2 - 24 \ln(x) + 37) x}

"F(x)", \frac{2 (\arctan(6) + \arctan(-6 + 2 \ln(x)))}{2 \arctan(6) + \pi}

"IDF(x)", \left[ \left[ s \rightarrow e^{\frac{1}{2} \tan\left( \frac{1}{2} s \pi + s \arctan(6) - \arctan(6) \right) + 3} \right], [0, 1], ["Continuous", "IDF"] \right]

"S(x)", \frac{\pi - 2 \arctan(-6 + 2 \ln(x))}{2 \arctan(6) + \pi}

"h(x)", \frac{4}{(4 \ln(x)^2 - 24 \ln(x) + 37) x (\pi - 2 \arctan(-6 + 2 \ln(x)))}

"mean and variance", \infty, undefined

"MF", \infty

```

$$\text{"MGF", } \int_1^{\infty} \frac{4 e^{tx}}{(2 \arctan(6) + \pi) (4 \ln(x)^2 - 24 \ln(x) + 37) x} dx$$

*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

$$4 \backslash, \{ \frac{1}{\left(2 \backslash, \arctan \left(6 \right) + \pi \right) \left(4 \backslash, \left(\ln \left(x \right) \right)^2 - 24 \backslash, \ln \left(x \right) + 37 \right) x} \}$$

"i is", 6,

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

"l and u", 0, ∞

$$\text{"g(x)", } \ln(x), \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } \frac{4 e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 24 e^x + 37)}$$

$$\text{"F(x)", } \frac{2 (\arctan(6) + \arctan(-6 + 2 e^x))}{2 \arctan(6) + \pi}$$

$$\text{"IDF(x)", } \left[\left[s \rightarrow -\ln(2) + \ln \left(\tan \left(\frac{1}{2} s \pi + s \arctan(6) - \arctan(6) \right) + 6 \right) \right], [0, 1], \right.$$

["Continuous", "IDF"]]

$$\text{"S(x)", } \frac{\pi - 2 \arctan(-6 + 2 e^x)}{2 \arctan(6) + \pi}$$

$$\text{"h(x)", } - \frac{4 e^x}{(-4 e^{2x} + 24 e^x - 37) (\pi - 2 \arctan(-6 + 2 e^x))}$$

$$\text{"mean and variance", } \frac{1}{2} \ln(37) - \ln(2), \int_{-\infty}^{\infty} \left(- \frac{4 x^2 e^x}{(2 \arctan(6) + \pi) (-4 e^{2x} + 24 e^x - 37)} \right)$$

$$dx - \frac{1}{4} \ln(37)^2 + \ln(2) \ln(37) - \ln(2)^2$$

$$\text{"MF", } \int_{-\infty}^{\infty} \frac{4 x^{\sim} e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 24 e^x + 37)} dx$$

"MGF", $\int_{-\infty}^{\infty} \left(-\frac{4 e^{x(t+1)}}{(2 \arctan(6) + \pi) (-4 e^{2x} + 24 e^x - 37)} \right) dx$
 $4 \frac{e^x}{\left(2 \arctan(6) + \pi \right) \left(-4 e^{2x} + 24 e^x - 37 \right)}$
 "i is", 7,
 "-----"
 "l and u", 0, ∞
 "g(x)", e^{-x} , "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"
 "f(x)", $\frac{4}{(2 \arctan(6) + \pi) (4 \ln(x)^2 + 24 \ln(x) + 37) x}$
 "F(x)", $\frac{\pi + 2 \arctan(6 + 2 \ln(x))}{2 \arctan(6) + \pi}$
 "IDF(x)", $\left[\left[s \rightarrow e^{-\frac{1}{2} \frac{6 \tan\left(\frac{1}{2} s (2 \arctan(6) + \pi)\right) + 1}}{\tan\left(\frac{1}{2} s (2 \arctan(6) + \pi)\right)}} \right], [0, 1], ["Continuous", "IDF"] \right]$
 "S(x)", $1 + \frac{-\pi - 2 \arctan(6 + 2 \ln(x))}{2 \arctan(6) + \pi}$
 "h(x)", $\frac{2}{(4 \ln(x)^2 + 24 \ln(x) + 37) x (\arctan(6) - \arctan(6 + 2 \ln(x)))}$
 "mean and variance", $\frac{I e^{-3 - \frac{1}{2} I} \left(e^I \text{Ei}\left(1, -3 + \frac{1}{2} I\right) - \text{Ei}\left(1, -3 - \frac{1}{2} I\right) \right)}{2 \arctan(6) + \pi},$
 $\frac{1}{(2 \arctan(6) + \pi)^2} \left(e^{-6} \left(2 I e^I \text{Ei}\left(1, -6 + I\right) \arctan(6) - 2 I e^{-I} \text{Ei}\left(1, -6 - I\right) \arctan(6) \right. \right.$
 $\left. \left. + I e^I \text{Ei}\left(1, -6 + I\right) \pi - I e^{-I} \text{Ei}\left(1, -6 - I\right) \pi + e^I \text{Ei}\left(1, -3 + \frac{1}{2} I\right)^2 + e^{-I} \text{Ei}\left(1, -3 - \frac{1}{2} I\right)^2 - 2 \text{Ei}\left(1, -3 + \frac{1}{2} I\right) \text{Ei}\left(1, -3 - \frac{1}{2} I\right) \right) \right)$
 "MF", $\frac{I \left(e^{\frac{1}{2} I r_{\sim}} \text{Ei}\left(1, -3 r_{\sim} + \frac{1}{2} I r_{\sim}\right) - e^{-\frac{1}{2} I r_{\sim}} \text{Ei}\left(1, -3 r_{\sim} - \frac{1}{2} I r_{\sim}\right) \right) e^{-3 r_{\sim}}}{2 \arctan(6) + \pi}$

$$\text{"MGF", } \frac{4 \left(\int_0^1 \frac{e^{tx}}{(4 \ln(x)^2 + 24 \ln(x) + 37) x} dx \right)}{2 \arctan(6) + \pi}$$

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

$$4 \backslash, \{ \frac{1}{\left(2 \backslash, \arctan \left(6 \right) + \pi \right) \left(4 \backslash, \left(\ln \left(x \right) \right) \right)^2 + 24 \backslash, \ln \left(x \right) + 37 \right) x} \}$$

"i is", 8,

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

"l and u", 0, ∞

$$\text{"g(x)", } -\ln(x), \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } \frac{4 e^x}{(2 \arctan(6) + \pi) (37 e^{2x} - 24 e^x + 4)}$$

$$\text{"F(x)", } \frac{2 \left(\arctan(6) + \arctan\left(\frac{37}{2} e^x - 6\right) \right)}{2 \arctan(6) + \pi}$$

$$\text{"IDF(x)", } \left[\left[s \rightarrow \ln\left(\frac{2}{37}\right) + \ln\left(\tan\left(\frac{1}{2} s \pi + s \arctan(6) - \arctan(6)\right) + 6\right) \right], [0, 1], \right.$$

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

$$\text{"S(x)", } - \frac{-\pi + 2 \arctan\left(\frac{37}{2} e^x - 6\right)}{2 \arctan(6) + \pi}$$

$$\text{"h(x)", } - \frac{4 e^x}{(-37 e^{2x} + 24 e^x - 4) \left(\pi - 2 \arctan\left(\frac{37}{2} e^x - 6\right) \right)}$$

$$\text{"mean and variance", } -\frac{1}{2} \ln(37) + \ln(2), \int_{-\infty}^{\infty} \left(-\frac{4 x^2 e^x}{(2 \arctan(6) + \pi) (-37 e^{2x} + 24 e^x - 4)} \right) dx - \frac{1}{4} \ln(37)^2 + \ln(2) \ln(37) - \ln(2)^2$$

$$\text{"MF"}, \int_{-\infty}^{\infty} \frac{4 x^{\prime \sim} e^x}{(2 \arctan(6) + \pi) (37 e^{2x} - 24 e^x + 4)} dx$$

$$\text{"MGF"}, \int_{-\infty}^{\infty} \left(- \frac{4 e^{x(t+1)}}{(2 \arctan(6) + \pi) (-37 e^{2x} + 24 e^x - 4)} \right) dx$$

$$4 \backslash, \{ \frac {{{\rm e}^{\{x\}}}}{ \left(2 \backslash, \arctan \left(6 \right) + \right.} \\ \left. \pi \right) \left(37 \backslash, {{{\rm e}^{\{2 \backslash, x\}}} - 24 \backslash, {{{\rm e}^{\{x\}}} + 4} \right) } \}$$

"i is", 9,

"-----"

$$\text{"l and u", } 0, \infty \\ \text{"g(x), } \ln(x+1), \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x-3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } \frac{4 e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 32 e^x + 65)}$$

$$\text{"F(x)", } \frac{2 (\arctan(6) + \arctan(-8 + 2 e^x))}{2 \arctan(6) + \pi}$$

$$\text{"IDF(x)", } \left[\left[s \rightarrow -\ln(2) + \ln \left(\tan \left(\frac{1}{2} s \pi + s \arctan(6) - \arctan(6) \right) + 8 \right) \right], [0, 1], \right. \\ \left. [\text{"Continuous", "IDF"}] \right]$$

$$\text{"S(x)", } \frac{\pi - 2 \arctan(-8 + 2 e^x)}{2 \arctan(6) + \pi}$$

$$\text{"h(x)", } - \frac{4 e^x}{(-4 e^{2x} + 32 e^x - 65) (\pi - 2 \arctan(-8 + 2 e^x))}$$

$$\text{"mean and variance", } \frac{1}{2 \arctan(6) + \pi} \left(\text{I dilog} \left(\frac{49}{65} + \frac{2}{65} \text{I} \right) - \text{I dilog} \left(\frac{49}{65} - \frac{2}{65} \text{I} \right) \right. \\ \left. + \ln(5) \pi + \ln(13) \pi - 2 \pi \ln(2) - \ln(5) \arctan \left(\frac{1}{8} \right) - \ln(13) \arctan \left(\frac{1}{8} \right) \right. \\ \left. + 2 \ln(2) \arctan \left(\frac{1}{8} \right) \right), \frac{1}{(2 \arctan(6) + \pi)^2} \left(-2 \pi^2 \ln(5) \ln(13) + 4 \pi^2 \ln(5) \ln(2) \right. \\ \left. + 4 \pi^2 \ln(13) \ln(2) + 2 \pi \ln(5)^2 \arctan \left(\frac{1}{8} \right) + 2 \pi \ln(13)^2 \arctan \left(\frac{1}{8} \right) \right. \\ \left. - 2 \ln(5) \ln(13) \arctan \left(\frac{1}{8} \right)^2 + 4 \ln(5) \ln(2) \arctan \left(\frac{1}{8} \right)^2 \right)$$

$$\begin{aligned}
& + 4 \ln(13) \ln(2) \arctan\left(\frac{1}{8}\right)^2 + 8 \pi \ln(2)^2 \arctan\left(\frac{1}{8}\right) + \operatorname{dilog}\left(\frac{49}{65} + \frac{2}{65} I\right)^2 \\
& + \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right)^2 + 4 \arctan(6)^2 \left(\int_0^\infty \frac{4 x^2 e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 32 e^x + 65)} \right. \\
& \left. dx \right) + \pi^2 \left(\int_0^\infty \frac{4 x^2 e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 32 e^x + 65)} dx \right) - 4 I \operatorname{dilog}\left(\frac{49}{65} \right. \\
& \left. + \frac{2}{65} I\right) \ln(2) \arctan\left(\frac{1}{8}\right) + 4 I \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \ln(2) \arctan\left(\frac{1}{8}\right) \\
& + 4 I \pi \operatorname{dilog}\left(\frac{49}{65} + \frac{2}{65} I\right) \ln(2) - 4 I \pi \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \ln(2) + 2 I \operatorname{dilog}\left(\frac{49}{65} \right. \\
& \left. + \frac{2}{65} I\right) \ln(5) \arctan\left(\frac{1}{8}\right) - 2 I \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \ln(5) \arctan\left(\frac{1}{8}\right) \\
& - 2 I \pi \operatorname{dilog}\left(\frac{49}{65} + \frac{2}{65} I\right) \ln(5) + 2 I \pi \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \ln(5) + 2 I \operatorname{dilog}\left(\frac{49}{65} \right. \\
& \left. + \frac{2}{65} I\right) \ln(13) \arctan\left(\frac{1}{8}\right) - 2 I \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \ln(13) \arctan\left(\frac{1}{8}\right) \\
& - 2 I \pi \operatorname{dilog}\left(\frac{49}{65} + \frac{2}{65} I\right) \ln(13) + 2 I \pi \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \ln(13) + 4 \arctan(6) \pi \left(\right. \\
& \left. \int_0^\infty \frac{4 x^2 e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 32 e^x + 65)} dx \right) - 4 \ln(2)^2 \arctan\left(\frac{1}{8}\right)^2 \\
& + 4 \pi \ln(5) \ln(13) \arctan\left(\frac{1}{8}\right) - 8 \pi \ln(5) \ln(2) \arctan\left(\frac{1}{8}\right) \\
& - 8 \pi \ln(13) \ln(2) \arctan\left(\frac{1}{8}\right) - 2 \operatorname{dilog}\left(\frac{49}{65} + \frac{2}{65} I\right) \operatorname{dilog}\left(\frac{49}{65} - \frac{2}{65} I\right) \\
& - \pi^2 \ln(13)^2 - \ln(5)^2 \arctan\left(\frac{1}{8}\right)^2 - \ln(13)^2 \arctan\left(\frac{1}{8}\right)^2 - \ln(5)^2 \pi^2 - 4 \pi^2 \ln(2)^2 \Big)
\end{aligned}$$

$$\text{"MF"}, \int_0^{\infty} \frac{4 x^{\sim} e^x}{(2 \arctan(6) + \pi) (4 e^{2x} - 32 e^x + 65)} dx$$

$$\text{"MGF"}, \int_0^{\infty} \left(- \frac{4 e^{x(t+1)}}{(2 \arctan(6) + \pi) (-4 e^{2x} + 32 e^x - 65)} \right) dx$$

$$4 \backslash, \{ \backslash \frac { { { \backslash \rm e } ^ { x } } } { { \left(2 \backslash, \backslash \arctan \left(6 \right) + \backslash \pi \right. } } \left. \backslash \left(4 \backslash, { { \backslash \rm e } ^ { 2 \backslash, x } } - 32 \backslash, { { \backslash \rm e } ^ { x } } + 65 \right) } \right\}$$

"i is", 10,

"-----"

"l and u", 0, ∞

$$\text{"g(x)"}, \frac{1}{\ln(x+2)}, \text{"base"}, \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x-3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)"}, \frac{4 e^{\frac{1}{x}}}{(2 \arctan(6) + \pi) \left(4 e^{\frac{2}{x}} - 40 e^{\frac{1}{x}} + 101 \right) x^2}$$

$$\text{"F(x)"}, \frac{\pi - 2 \arctan \left(-10 + 2 e^{\frac{1}{x}} \right)}{2 \arctan(6) + \pi}$$

$$\text{"IDF(x)"}, \left[\left[s \rightarrow \frac{1}{-\ln(2) + \ln \left(\cot \left(\frac{1}{2} s (2 \arctan(6) + \pi) \right) + 10 \right)} \right], [0, 1], ["Continuous", \text{"IDF"}] \right]$$

$$\text{"S(x)"}, \frac{2 \left(\arctan(6) + \arctan \left(-10 + 2 e^{\frac{1}{x}} \right) \right)}{2 \arctan(6) + \pi}$$

$$\text{"h(x)"}, \frac{2 e^{\frac{1}{x}}}{\left(4 e^{\frac{2}{x}} - 40 e^{\frac{1}{x}} + 101 \right) x^2 \left(\arctan(6) + \arctan \left(-10 + 2 e^{\frac{1}{x}} \right) \right)}$$

$$4 \left(\int_0^{\frac{1}{\ln(2)}} \frac{e^{\frac{1}{x}}}{x \left(-4 e^{\frac{2}{x}} + 40 e^{\frac{1}{x}} - 101 \right)} dx \right)$$

$$\text{"mean and variance"}, - \frac{\left(\int_0^{\frac{1}{\ln(2)}} \frac{e^{\frac{1}{x}}}{x \left(-4 e^{\frac{2}{x}} + 40 e^{\frac{1}{x}} - 101 \right)} dx \right)}{2 \arctan(6) + \pi},$$

$$-\frac{1}{(2 \arctan(6) + \pi)^2} \left(4 \left(2 \left(\int_0^{\frac{1}{\ln(2)}} \frac{e^{\frac{1}{x}}}{-4 e^{\frac{2}{x}} + 40 e^{\frac{1}{x}} - 101} dx \right) \arctan(6) + \left(\int_0^{\frac{1}{\ln(2)}} \frac{e^{\frac{1}{x}}}{-4 e^{\frac{2}{x}} + 40 e^{\frac{1}{x}} - 101} dx \right) \pi + 4 \left(\int_0^{\frac{1}{\ln(2)}} \frac{e^{\frac{1}{x}}}{x \left(-4 e^{\frac{2}{x}} + 40 e^{\frac{1}{x}} - 101 \right)} dx \right)^2 \right) \right)$$

$$\text{"MF",} \int_0^{\frac{1}{\ln(2)}} \frac{4 x^{\frac{1}{x}}}{(2 \arctan(6) + \pi) \left(4 e^{\frac{2}{x}} - 40 e^{\frac{1}{x}} + 101 \right) x^2} dx$$

$$\text{"MGF",} - \frac{4 \left(\int_0^{\frac{1}{\ln(2)}} \frac{e^{\frac{tx^2+1}{x}}}{\left(-4 e^{\frac{2}{x}} + 40 e^{\frac{1}{x}} - 101 \right) x^2} dx \right)}{2 \arctan(6) + \pi}$$

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

```
4\,{\frac {{{\rm e}^{\left\{ {x^{\left\{ {-1} \right\}}} } \left( {2\,\arctan \left( {6\right)} + \right.}
\pi \left. \right) {x^2}} \left( {4\,{{\rm e}^{\left\{ {2\,{{x}^{\left\{ {-1} \right\}}} } -40\,{{\rm e}^{\left\{ {x^{\left\{ {-1} \right\}}} } +101 \right.} \right.}
\left. \right) ^{-1}}}
```

"is", 11,

"-----"

"l and u", 0, ∞

$$\text{"g(x)", } \tanh(x), \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } - \frac{4}{(2 \arctan(6) + \pi) (4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37) (x^2 - 1)}$$

$$\text{"F(x)", } \frac{2 (\arctan(6) + \arctan(-6 + 2 \operatorname{arctanh}(x)))}{2 \arctan(6) + \pi}$$

$$\text{"IDF(x)", } \left[\left[s \rightarrow \tanh \left(3 + \frac{1}{2} \tan \left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6) \right) \right) \right], [0, 1], \right.$$

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

$$\text{"S(x)", } - \frac{-\pi + 2 \arctan(-6 + 2 \operatorname{arctanh}(x))}{2 \arctan(6) + \pi}$$

$$\text{"h(x)", } \frac{4}{(4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37) (x^2 - 1) (-\pi + 2 \arctan(-6 + 2 \operatorname{arctanh}(x)))}$$

$$\text{"mean and variance", } - \frac{4 \left(\int_0^1 \frac{x}{(x^2 - 1) (4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37)} dx \right)}{2 \arctan(6) + \pi},$$

$$- \frac{1}{(2 \arctan(6) + \pi)^2} \left(4 \left(2 \left(\int_0^1 \frac{x^2}{(x^2 - 1) (4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37)} \right. \right. \right.$$

$$\left. dx \right) \arctan(6) + \left(\int_0^1 \frac{x^2}{(x^2 - 1) (4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37)} dx \right) \pi$$

$$+ 4 \left(\int_0^1 \frac{x}{(x^2 - 1) (4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37)} dx \right)^2 \Bigg)$$

$$\text{"MF", } \int_0^1 \left(- \frac{4 x^{\sim}}{(2 \arctan(6) + \pi) (4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37) (x^2 - 1)} \right) dx$$

$$\text{"MGF", } - \frac{4 \left(\int_0^1 \frac{e^{tx}}{(4 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 37) (x^2 - 1)} dx \right)}{2 \arctan(6) + \pi}$$

*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

```
-4\,{\frac {1}{\left( 2\,{\arctan \left( 6 \right) }+\pi \right)
\left( 4\,{\left( {\rm arctanh} \left( x \right) \right) }^2
-24\,{\rm arctanh} \left( x \right) +37 \right) }}{\left( {x}^2-1
\right) }}
"i is", 12,
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"-----"
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"l and u", 0, ∞
 "g(x)", $\sinh(x)$, "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"

"f(x)", $\frac{4}{(2 \arctan(6) + \pi) (4 \operatorname{arcsinh}(x)^2 - 24 \operatorname{arcsinh}(x) + 37) \sqrt{x^2 + 1}}$

"F(x)", $\frac{2 \left(\arctan(6) - \arctan(6 + 2 \ln(-x + \sqrt{x^2 + 1})) \right)}{2 \arctan(6) + \pi}$

"IDF(x)", $\left[\left[s \rightarrow -\frac{1}{2} \left(e^{-\tan\left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6)\right) - 6} - 1 \right) e^{3 + \frac{1}{2} \tan\left(s \arctan(6) + \frac{1}{2} s \pi - \arctan(6)\right)} \right], [0, 1], ["Continuous", "IDF"] \right]$

"S(x)", $\frac{\pi + 2 \arctan(6 + 2 \ln(-x + \sqrt{x^2 + 1}))}{2 \arctan(6) + \pi}$

"h(x)",
 $4 / \left((4 \operatorname{arcsinh}(x)^2 - 24 \operatorname{arcsinh}(x) + 37) \sqrt{x^2 + 1} (\pi + 2 \arctan(6 + 2 \ln(-x + \sqrt{x^2 + 1}))) \right)$

"mean and variance", ∞ , *undefined*

"MF", ∞

"MGF", $\int_0^{\infty} \frac{4 e^{tx}}{(2 \arctan(6) + \pi) (4 \operatorname{arcsinh}(x)^2 - 24 \operatorname{arcsinh}(x) + 37) \sqrt{x^2 + 1}} dx$

```
4\,{\frac {1}{\left( 2\,{\arctan \left( 6 \right) }+\pi \right)
\left( 4\,{\left( {\rm arcsinh} \left( x \right) \right) }^2
-24\,{\rm arcsinh} \left( x \right) +37 \right) \sqrt {{{x}^2}+1}}}}
"i is", 13,
```

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"-----"
-----"
```

"l and u", 0, ∞

"g(x)", arcsinh(x), "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"

"f(x)", $-\frac{4 \cosh(x)}{(2 \arctan(6) + \pi) (-4 \cosh(x)^2 + 24 \sinh(x) - 33)}$

"F(x)", $\frac{1}{2 \arctan(6) + \pi} \left(\operatorname{I} \ln \left(\frac{(6 + \operatorname{I}) (\operatorname{I} e^x + e^{2x} - 6 e^x - 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) \right.$
 $\left. - \operatorname{I} \ln \left(\frac{(-6 + \operatorname{I}) (\operatorname{I} e^x - e^{2x} + 6 e^x + 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) + 2 \pi \right)$

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

"S(x)", $\frac{1}{2 \arctan(6) + \pi} \left(-\operatorname{I} \ln \left(\frac{(6 + \operatorname{I}) (\operatorname{I} e^x + e^{2x} - 6 e^x - 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) \right.$
 $\left. + \operatorname{I} \ln \left(\frac{(-6 + \operatorname{I}) (\operatorname{I} e^x - e^{2x} + 6 e^x + 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) + 2 \arctan(6) - \pi \right)$

"h(x)", $-(4 \cosh(x)) \left/ \left(\left(\operatorname{I} \ln \left(\frac{(6 + \operatorname{I}) (\operatorname{I} e^x + e^{2x} - 6 e^x - 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) \right. \right. \right.$
 $\left. \left. - \operatorname{I} \ln \left(\frac{(-6 + \operatorname{I}) (\operatorname{I} e^x - e^{2x} + 6 e^x + 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) - 2 \arctan(6) + \pi \right) (4 \cosh(x)^2 \right.$
 $\left. - 24 \sinh(x) + 33 \right)$

"MF", $\int_0^\infty \left(-\frac{4 x^{\sim} \cosh(x)}{(2 \arctan(6) + \pi) (-4 \cosh(x)^2 + 24 \sinh(x) - 33)} \right) dx$

"MGF", $\int_0^\infty \frac{4 e^{tx} \cosh(x)}{(2 \arctan(6) + \pi) (4 \cosh(x)^2 - 24 \sinh(x) + 33)} dx$

$-4 \backslash, \{ \frac{\cosh \left(x \right) }{ \left(2 \backslash, \arctan \left(6 \right) + \pi \right) \left(-4 \backslash, \left(\cosh \left(x \right) \right. \right. \right.}$
 $\left. \left. \left. \right) ^{2} + 24 \backslash, \sinh \left(x \right) - 33 \right) \} \}$

"i is", 14,

"-----"

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"l and u", 0, ∞

"g(x)", csch(x + 1), "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"

"f(x)", $\frac{4}{\sqrt{x^2 + 1} (2 \arctan(6) + \pi) (4 \operatorname{arccsch}(x)^2 - 32 \operatorname{arccsch}(x) + 65) |x|}$

"i is", 15,

"-----"
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"i is", 16,

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

"l and u", 0, ∞

$$\text{"g(x)", } \frac{1}{\tanh(x+1)}, \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x-3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } \frac{4}{(2 \arctan(6) + \pi) \left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65\right) (x^2 - 1)}$$

$$\text{"F(x)", } -\frac{-\pi + 2 \arctan\left(-8 + 2 \operatorname{arctanh}\left(\frac{1}{x}\right)\right)}{2 \arctan(6) + \pi}$$

$$\text{"IDF(x)", } \left[\left[s \rightarrow \frac{1}{\tanh\left(4 + \frac{1}{2} \cot\left(\frac{1}{2} s (2 \arctan(6) + \pi)\right)\right)} \right], [0, 1], [\text{"Continuous"},\right.$$

\left. \text{"IDF"} \right]

$$\text{"S(x)", } 1 + \frac{-\pi + 2 \arctan\left(-8 + 2 \operatorname{arctanh}\left(\frac{1}{x}\right)\right)}{2 \arctan(6) + \pi}$$

$$\text{"h(x)", } 2 \Bigg/ \left(\left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right) (x^2 - 1) \left(\arctan\left(-8 + 2 \operatorname{arctanh}\left(\frac{1}{x}\right)\right) + \arctan(6) \right) \right)$$

$$\text{"mean and variance", } \frac{4 \left(\int_1^{\frac{e^2+1}{e^2-1}} \frac{x}{(x^2-1) \left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right)} dx \right)}{2 \arctan(6) + \pi},$$

$$\frac{1}{(2 \arctan(6) + \pi)^2} \left(4 \left(2 \left(\right. \right. \right)$$

$$\begin{aligned}
& \left(\int_1^{\frac{e^2+1}{e^2-1}} \frac{x^2}{(x^2-1) \left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right)} dx \operatorname{arctan}(6) + \left(\int_1^{\frac{e^2+1}{e^2-1}} \frac{x^2}{(x^2-1) \left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right)} dx \pi \right. \right. \\
& \left. \left. - 4 \left(\int_1^{\frac{e^2+1}{e^2-1}} \frac{x}{(x^2-1) \left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right)} dx \right)^2 \right) \right) \\
\text{"MF", } & \int_1^{\frac{e+e^{-1}}{e-e^{-1}}} \frac{4 x^{\sqrt{x}}}{(2 \operatorname{arctan}(6) + \pi) \left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right) (x^2-1)} dx \\
\text{"MGF", } & \frac{4 \left(\int_1^{\frac{e^2+1}{e^2-1}} \frac{e^{tx}}{\left(4 \operatorname{arctanh}\left(\frac{1}{x}\right)^2 - 32 \operatorname{arctanh}\left(\frac{1}{x}\right) + 65 \right) (x^2-1)} dx \right)}{2 \operatorname{arctan}(6) + \pi}
\end{aligned}$$

*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

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

Resetting high to RV's maximum support value

```
4\,{\frac {1}{\left( 2\,{\arctan \left( 6 \right) +\pi \right)}
\left( 4\,{\rm arctanh} \left( {x}^{-1}\right) \right) ^
{2}-32
\,{\rm arctanh} \left( {x}^{-1}\right) +65 \right) \left( {x}^{2}
-1
\right) }}
```

"i is", 17,

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"-----"
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"l and u", 0, ∞

$$\text{"g(x)", } \frac{1}{\sinh(x+1)}, \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2}\pi\right)(1+4(x-3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } \frac{4}{\sqrt{x^2+1}(2\arctan(6)+\pi)\left(4\operatorname{arcsinh}\left(\frac{1}{x}\right)^2-32\operatorname{arcsinh}\left(\frac{1}{x}\right)+65\right)|x|}$$

"i is", 18,

```
"-----"
-----"
```

"l and u", 0, ∞

$$\text{"g(x)", } \frac{1}{\operatorname{arcsinh}(x+1)}, \text{"base", } \frac{2}{\left(\arctan(6) + \frac{1}{2}\pi\right)(1+4(x-3)^2)}, \text{"ArcTanRV(2,3)"}$$

$$\text{"f(x)", } -\frac{4\cosh\left(\frac{1}{x}\right)}{(2\arctan(6)+\pi)x^2\left(-4\cosh\left(\frac{1}{x}\right)^2+32\sinh\left(\frac{1}{x}\right)-61\right)}$$

$$\text{"F(x)", } -\frac{1}{2\arctan(6)+\pi}\left(\operatorname{I}\ln\left((8+\operatorname{I})\left(e^{\frac{2}{x}}+\operatorname{I}e^{\frac{1}{x}}-8e^{\frac{1}{x}}-1\right)\right)-\operatorname{I}\ln\left((-8+\operatorname{I})\left(\operatorname{I}e^{\frac{1}{x}}-e^{\frac{2}{x}}+8e^{\frac{1}{x}}+1\right)\right)+2\arctan\left(\frac{1}{8}\right)\right)$$

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

$$\text{"S(x)", } -\frac{1}{2\arctan(6)+\pi}\left(-\operatorname{I}\ln\left(\frac{(8+\operatorname{I})\left(e^{\frac{2}{x}}+\operatorname{I}e^{\frac{1}{x}}-8e^{\frac{1}{x}}-1\right)}{\sqrt{e^{\frac{4}{x}}-16e^{\frac{3}{x}}+63e^{\frac{2}{x}}+16e^{\frac{1}{x}}+1}}\right)\right)$$

$$\begin{aligned}
& + \operatorname{I} \ln \left(\frac{(-8 + \operatorname{I}) \left(\operatorname{I} e^{\frac{1}{x}} - e^{\frac{2}{x}} + 8 e^{\frac{1}{x}} + 1 \right)}{\sqrt{e^{\frac{4}{x}} - 16 e^{\frac{3}{x}} + 63 e^{\frac{2}{x}} + 16 e^{\frac{1}{x}} + 1}} \right) - 2 \arctan(6) - \pi - 2 \arctan\left(\frac{1}{8}\right) \\
& \text{"h(x)", } \left(4 \cosh\left(\frac{1}{x}\right) \right) / \left(x^2 \left(2 \arctan\left(\frac{49}{2}\right) \right. \right. \\
& \left. \left. + \operatorname{I} \ln \left(\frac{(8 + \operatorname{I}) \left(e^{\frac{2}{x}} + \operatorname{I} e^{\frac{1}{x}} - 8 e^{\frac{1}{x}} - 1 \right)}{\sqrt{e^{\frac{4}{x}} - 16 e^{\frac{3}{x}} + 63 e^{\frac{2}{x}} + 16 e^{\frac{1}{x}} + 1}} \right) \right. \right. \\
& \left. \left. - \operatorname{I} \ln \left(\frac{(-8 + \operatorname{I}) \left(\operatorname{I} e^{\frac{1}{x}} - e^{\frac{2}{x}} + 8 e^{\frac{1}{x}} + 1 \right)}{\sqrt{e^{\frac{4}{x}} - 16 e^{\frac{3}{x}} + 63 e^{\frac{2}{x}} + 16 e^{\frac{1}{x}} + 1}} \right) + \pi \right) \left(4 \cosh\left(\frac{1}{x}\right)^2 - 32 \sinh\left(\frac{1}{x}\right) \right. \right. \\
& \left. \left. + 61 \right) \right)
\end{aligned}$$

$$\begin{aligned}
& \text{"mean and variance", } \frac{4 \left(\int_0^{\frac{1}{\ln(1 + \sqrt{2})}} \frac{\cosh\left(\frac{1}{x}\right)}{x \left(4 \cosh\left(\frac{1}{x}\right)^2 - 32 \sinh\left(\frac{1}{x}\right) + 61 \right)} dx \right)}{2 \arctan(6) + \pi},
\end{aligned}$$

$$\begin{aligned}
& - \frac{1}{(2 \arctan(6) + \pi)^2} \left(4 \left(2 \left(\int_0^{\frac{1}{\ln(1 + \sqrt{2})}} \frac{\cosh\left(\frac{1}{x}\right)}{-4 \cosh\left(\frac{1}{x}\right)^2 + 32 \sinh\left(\frac{1}{x}\right) - 61} \right. \right. \right. \\
& \left. \left. dx \right) \arctan(6) + \left(\int_0^{\frac{1}{\ln(1 + \sqrt{2})}} \frac{\cosh\left(\frac{1}{x}\right)}{-4 \cosh\left(\frac{1}{x}\right)^2 + 32 \sinh\left(\frac{1}{x}\right) - 61} dx \right) \pi \right)
\end{aligned}$$

$$\begin{aligned}
& + 4 \left(\int_0^{\frac{1}{\ln(1+\sqrt{2})}} \frac{\cosh\left(\frac{1}{x}\right)}{x \left(4 \cosh\left(\frac{1}{x}\right)^2 - 32 \sinh\left(\frac{1}{x}\right) + 61 \right)} dx \right)^2 \Bigg) \\
\text{"MF", } & \int_0^{\frac{1}{\ln(1+\sqrt{2})}} \left(- \frac{4 x^{\sim} \cosh\left(\frac{1}{x}\right)}{(2 \arctan(6) + \pi) x^2 \left(-4 \cosh\left(\frac{1}{x}\right)^2 + 32 \sinh\left(\frac{1}{x}\right) - 61 \right)} \right) dx \\
\text{"MGF", } & \frac{4 \left(\int_0^{\frac{1}{\ln(1+\sqrt{2})}} \frac{e^{tx} \cosh\left(\frac{1}{x}\right)}{x^2 \left(4 \cosh\left(\frac{1}{x}\right)^2 - 32 \sinh\left(\frac{1}{x}\right) + 61 \right)} dx \right)}{2 \arctan(6) + \pi}
\end{aligned}$$

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

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

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, $\frac{1}{\ln(1+\sqrt{2})}$

Resetting high to RV's maximum support value

```

-4\, {\frac {\cosh \left( {x}^{-1} \right) }{ \left( 2\, \arctan
\left(
6 \right) +\pi \right) {x}^2 \left( -4\, \left( \cosh \left(
{x}^{-1} \right) \right) ^2+32\, \sinh \left( {x}^{-1} \right) -61
\right)
}}

```

"i is", 19,

"-----"

"l and u", 0, ∞

"g(x)", $\frac{1}{\operatorname{csch}(x)} + 1$, "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"

"f(x)",

$$\begin{aligned}
& \frac{4}{\sqrt{x^2 - 2x + 2} \left(2 \arctan(6) + \pi \right) \left(4 \operatorname{arccsch}\left(\frac{1}{x-1}\right)^2 - 24 \operatorname{arccsch}\left(\frac{1}{x-1}\right) + 37 \right)} \\
& \frac{4 \left(\int_1^x \frac{1}{\sqrt{t^2 - 2t + 2} \left(4 \operatorname{arccsch}\left(\frac{1}{t-1}\right)^2 - 24 \operatorname{arccsch}\left(\frac{1}{t-1}\right) + 37 \right)} dt \right)}{2 \arctan(6) + \pi} \\
& \text{"S(x)", } -\frac{1}{2 \arctan(6) + \pi} \left(-2 \arctan(6) - \pi + 4 \left(\int_1^x \frac{1}{\sqrt{t^2 - 2t + 2} \left(4 \operatorname{arccsch}\left(\frac{1}{t-1}\right)^2 - 24 \operatorname{arccsch}\left(\frac{1}{t-1}\right) + 37 \right)} dt \right) \right) \\
& \text{"h(x)", } -4 \left(\sqrt{x^2 - 2x + 2} \left(4 \operatorname{arccsch}\left(\frac{1}{x-1}\right)^2 - 24 \operatorname{arccsch}\left(\frac{1}{x-1}\right) + 37 \right) \left(-2 \arctan(6) - \pi + 4 \left(\int_1^x \frac{1}{\sqrt{t^2 - 2t + 2} \left(4 \operatorname{arccsch}\left(\frac{1}{t-1}\right)^2 - 24 \operatorname{arccsch}\left(\frac{1}{t-1}\right) + 37 \right)} dt \right) \right) \right) \\
& \text{"mean and variance", } \infty, \text{undefined} \\
& \text{"MF", } \infty \\
& \text{"MGF", } \int_1^\infty \frac{4 e^{tx}}{\sqrt{x^2 - 2x + 2} \left(2 \arctan(6) + \pi \right) \left(4 \operatorname{arccsch}\left(\frac{1}{x-1}\right)^2 - 24 \operatorname{arccsch}\left(\frac{1}{x-1}\right) + 37 \right)} dx \\
& \text{WARNING(PlotDist): Low value provided by user, 0 is less than minimum support value of random variable}
\end{aligned}$$

$$\begin{aligned}
& \left. dx \right) \arctan(6) + \left(\int_0^1 \frac{x^2}{(x^2 - 1) (37 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 4)} dx \right) \pi \\
& + 4 \left(\int_0^1 \frac{x}{(x^2 - 1) (37 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 4)} dx \right)^2 \bigg) \bigg) \\
\text{"MF"}, & \int_0^1 \left(- \frac{4 x^{\sim}}{(2 \arctan(6) + \pi) (37 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 4) (x^2 - 1)} \right) dx \\
\text{"MGF"}, & - \frac{4 \left(\int_0^1 \frac{e^{tx}}{(37 \operatorname{arctanh}(x)^2 - 24 \operatorname{arctanh}(x) + 4) (x^2 - 1)} dx \right)}{2 \arctan(6) + \pi}
\end{aligned}$$

*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

$$-4 \frac{1}{\left(2 \arctan \left(6 \right) + \pi \right) \left(37 \operatorname{arctanh} \left(x \right) ^2 - 24 \operatorname{arctanh} \left(x \right) + 4 \right) \left(x^2 - 1 \right)}$$

"i is", 21,

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

"l and u", 0, ∞

"g(x)", $\operatorname{csch}\left(\frac{1}{x}\right)$, "base", $\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi \right) (1 + 4 (x - 3)^2)}$, "ArcTanRV(2,3)"

"f(x)", $\frac{4}{\sqrt{x^2 + 1} (2 \arctan(6) + \pi) (37 \operatorname{arcsch}(x)^2 - 24 \operatorname{arcsch}(x) + 4) |x|}$

"F(x)", $\frac{4 \left(\int_0^x \frac{1}{\sqrt{t^2 + 1} (37 \operatorname{arcsch}(t)^2 - 24 \operatorname{arcsch}(t) + 4) |t|} dt \right)}{2 \arctan(6) + \pi}$

"S(x)",
$$\frac{2 \arctan(6) + \pi - 4 \left(\int_0^x \frac{1}{\sqrt{t^2 + 1} (37 \operatorname{arccsch}(t)^2 - 24 \operatorname{arccsch}(t) + 4) |t|} dt \right)}{2 \arctan(6) + \pi}$$

"h(x)",
$$4 \left/ \left(\sqrt{x^2 + 1} (37 \operatorname{arccsch}(x)^2 - 24 \operatorname{arccsch}(x) + 4) |x| \left(2 \arctan(6) + \pi - 4 \left(\int_0^x \frac{1}{\sqrt{t^2 + 1} (37 \operatorname{arccsch}(t)^2 - 24 \operatorname{arccsch}(t) + 4) |t|} dt \right) \right) \right) \right)$$

"mean and variance", ∞ , *undefined*

"MF",
$$\int_0^\infty \frac{4 x^{\tilde{r}}}{\sqrt{x^2 + 1} (2 \arctan(6) + \pi) (37 \operatorname{arccsch}(x)^2 - 24 \operatorname{arccsch}(x) + 4) |x|} dx$$

"MGF",
$$\int_0^\infty \frac{4 e^{tx}}{\sqrt{x^2 + 1} (2 \arctan(6) + \pi) (37 \operatorname{arccsch}(x)^2 - 24 \operatorname{arccsch}(x) + 4) x} dx$$

4\, , {\frac {1}{\sqrt {{x}^{2}+1}} \left(2\, , \arctan \left(6 \right) + \right. }
\pi \left. \right) \left(37\, , \left({\rm arccsch} \left(x \right) \right) \right. }
\left. \right)^{2}-24\, , {\rm arccsch} \left(x \right) +4 \left. \right) \left| x \right| }
\left. \right\}

"i is", 22,
"-----"
-----"

"l and u", 0, ∞

"g(x)", $\operatorname{arccsch}\left(\frac{1}{x}\right)$, "base",
$$\frac{2}{\left(\arctan(6) + \frac{1}{2} \pi\right) (1 + 4 (x - 3)^2)}$$
, "ArcTanRV(2,3)"

"f(x)",
$$-\frac{4 \cosh(x)}{(2 \arctan(6) + \pi) (-4 \cosh(x)^2 + 24 \sinh(x) - 33)}$$

"F(x)",
$$\frac{1}{2 \arctan(6) + \pi} \left(\operatorname{I} \ln \left(\frac{(6 + \operatorname{I}) (\operatorname{I} e^x + e^{2x} - 6 e^x - 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) \right. \\ \left. - \operatorname{I} \ln \left(\frac{(-6 + \operatorname{I}) (\operatorname{I} e^x - e^{2x} + 6 e^x + 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) + 2 \pi \right)$$

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

"S(x)",
$$\frac{1}{2 \arctan(6) + \pi} \left(-\operatorname{I} \ln \left(\frac{(6 + \operatorname{I}) (\operatorname{I} e^x + e^{2x} - 6 e^x - 1)}{\sqrt{e^{4x} - 12 e^{3x} + 35 e^{2x} + 12 e^x + 1}} \right) \right.$$

$$\begin{aligned}
& + \operatorname{I} \ln \left(\frac{(6 - \operatorname{I}) (-\operatorname{I} \mathrm{e}^x + \mathrm{e}^{2x} - 6 \mathrm{e}^x - 1)}{\sqrt{\mathrm{e}^{4x} - 12 \mathrm{e}^{3x} + 35 \mathrm{e}^{2x} + 12 \mathrm{e}^x + 1}} \right) + 2 \arctan(6) - \pi \Bigg) \\
& "h(x)", (4 \cosh(x)) \Bigg/ \left(\left(-\operatorname{I} \ln \left(\frac{(6 + \operatorname{I}) (\operatorname{I} \mathrm{e}^x + \mathrm{e}^{2x} - 6 \mathrm{e}^x - 1)}{\sqrt{\mathrm{e}^{4x} - 12 \mathrm{e}^{3x} + 35 \mathrm{e}^{2x} + 12 \mathrm{e}^x + 1}} \right) \right. \right. \\
& \left. \left. + \operatorname{I} \ln \left(\frac{(-6 + \operatorname{I}) (\operatorname{I} \mathrm{e}^x - \mathrm{e}^{2x} + 6 \mathrm{e}^x + 1)}{\sqrt{\mathrm{e}^{4x} - 12 \mathrm{e}^{3x} + 35 \mathrm{e}^{2x} + 12 \mathrm{e}^x + 1}} \right) + 2 \arctan(6) - \pi \right) (4 \cosh(x)^2 \right. \\
& \left. \left. - 24 \sinh(x) + 33 \right) \right) \\
& -4 \backslash, \{ \frac{\cosh \left(x \right)}{\left(2 \backslash, \arctan \left(6 \right) + \pi \right)} \left(-4 \backslash, \left(\cosh \left(x \right) \right. \right. \\
& \left. \left. \right)^2 + 24 \backslash, \sinh \left(x \right) - 33 \right) \}
\end{aligned}$$