```
> 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),

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

```
> bf := GeneralizedParetoRV(2,3,4);
  bfname := "GeneralizedParetoRV(2,3,4)";
```

$$bf := \left[\left[\left[x \to \dfrac{\left(2 + \dfrac{4}{x+3}\right) e^{-2x}}{\left(1 + \dfrac{1}{3}x\right)^4}\right], [0, \infty], ["Continuous", "PDF"]\right]\right]$$

$$bfname := "GeneralizedParetoRV(2,3,4)" \tag{1}$$

```
> #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);
```

$$-\ln(y) \tag{2}$$

```
> # discarded  -ln(t + 1),  t-> csch(t),t->arccsch(t),t -> tan(t),
> #name of the file for latex output
  filename := "C:/LatexOutput/Trash.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 loopint through transformations
  for i from 22 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

  PlotDist(PDF(Temp), 0, 40);
  PlotDist(HF(Temp), 0, 40);


od;
```

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

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

"i is", 22,

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

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

$$l := 0$$

$$u := \infty$$

$$Temp := \Big[\big[y\text{\textasciitilde} \rightarrow \left(162\,(\sinh(y\text{\textasciitilde}) + 5)\,e^{-2\sinh(y\text{\textasciitilde})}\cosh(y\text{\textasciitilde})\right)\big/\big(\cosh(y\text{\textasciitilde})^4\sinh(y\text{\textasciitilde})$$
$$+\, 15\cosh(y\text{\textasciitilde})^4 + 88\cosh(y\text{\textasciitilde})^2\sinh(y\text{\textasciitilde}) + 240\cosh(y\text{\textasciitilde})^2 + 316\sinh(y\text{\textasciitilde}) - 12\big)\big],\,[0,$$
$$\infty],\,[\text{"Continuous"},\,\text{"PDF"}]\Big]$$