Package 'PSDistr'

January 20, 2025

Title Distributions Derived from Normal Distribution

Version 0.0.1

Description Presentation of distributions such as: two-piece power normal (TPPN), plasticizing component (PC), DS normal (DSN), expnormal (EN), Sulewski plasticizing component (SPC), easily changeable kurtosis (ECK) distributions. Density, distribution function, quantile function and random generation are presented. For details on this method see: Sulewski (2019) <doi:10.1080/03610926.2019.1674871>, Sulewski (2021) <doi:10.1080/0361092
bers of the Johnson family of probability dis-tributions: properties and application">, Sulewski, Volodin (2022) <doi:10.1134/S1995080222110270>, Sulewski (2023) <doi:10.17713/ajs.v52i3.1434>.

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Contents

`ddsn` *DS Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the DS normal distribution with parameters a, b, c and d.

Usage

```
ddsn(x, a, b, c, teta)
```

Arguments

`x`	real argument
`a`	non-negative multipurpose parameter and a+b>0
`b`	non-negative multipurpose parameter and a+b>0
`c`	real multipurpose parameter
`teta`	real position parameter

Details

Probability density function in Latex see formula (5) in the paper Cumulative distribution function in Latex see formula (6) Quantile function see formulas (8,9,10) Random number generator see Theorem (5)

Value

The function returns the value of the probability density function for the DS normal distribution

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian Uniwersity in Slupsk.

References

Sulewski P. (2021). *DS Normal Distribution: properties and applications.* Lobachevskii Journal of Mathematics 42(12), 2980-2999.

Examples

```
ddsn(-0.5,2,2,2,0)
pdsn(-0.5,2,2,2,0)
qdsn(0.5,2,2,2,0)
rdsn(10,2,2,2,0)
```

---

deck *Easily Changeable Kurtosis Distribution*

Description

Density, distribution function, quantile function and random generation for the Easily Changeable Kurtosis Distribution with parameters a and p.

Usage

```
deck(x, a, p)
```

Arguments

x	-a<x<a for -1<p<0 or -a<=x<=a for p>=1
a	positive scale parameter
p	shape parameter: p>-1

Details

Probability density function see formula (1) or (3) in the article Cumulative distribution function see formula (4) Quantile functon see formula (20) Random number generator see formula (41)

Value

The function returns the value of the probability density function for the Easily Changeable Kurtosis Distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *Easily Changeable Kurtosis Distribution.* Austrian Journal of Statistics 52, 1-24.

Examples

```
deck(1,2,3)
peck(1,2,3)
qeck(0.5,2,3)
reck(10,2,3)
```

---

den *Expnormal Distribution*

Description

Density, distribution function, quantile function and random generation for the Expnormal distribution with parameters a1, b1, a2, b2 and c.

Usage

```
den(x, a1, b1, a2, b2, c)
```

Arguments

x	real argument
a1	position parameter
b1	positive scale parameter
a2	position parameter
b2	positive scale parameter
c	semi-fraction parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.3) Quantile functon see proposition (2.2) Random number generator see proposition (2.6)

Value

The function returns the value of the probability density function for the Expnormal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *New Members of The Johnson Family of Probability Distributions:Properties and Application,* Accepted: February 2022. REVSTAT-Statistical Journal.

Examples

```
den(1,1,2,2,2,1)
pen(1,1,2,2,2,1)
qen(0.5,1,2,2,2,1)
ren(10,1,2,2,2,1)
```

---

dpc *Plasticizing Component*

Description

Density, distribution function, quantile function and random generation for the plasticizing component with parameters teta, s2 and c.

Usage

```
dpc(x, teta, s2, c)
```

Arguments

x	real argument
teta	position parameter
s2	positive scale parameter
c	shape parameter (c>=1)

Details

Probability density function see formula (2) in the article Cumulative distribution function see formula (4) Quantile functon see formula (9) Random number generator see formula (23)

Value

The function returns the value of the probability density function for the plasticizing component.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2020). *Normal Distribution with Plasticizing Component,* Communications in Statistics ? Theory and Method 51(11), 3806-3835.

Examples

```
dpc(0,1,2,2)
ppc(0,1,2,2)
qpc(0.5,1,2,2)
rpc(10,1,2,2)
```

---

dspc *Sulewski Plasticizing Component Distribution*

Description

Density, distribution function, quantile function and random generation for the Sulewski plasticizing component distribution with parameters a, b, c, d and teta.

Usage

```
dspc(x, a, b, c, d, teta)
```

Arguments

x	real argument
a	multipurpose parameter (a>=0)
b	multipurpose parameter (b>=0, a+b>0)
c	multipurpose parameter
d	multipurpose parameter (d>=1)
teta	position parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.2) Quantile functon see formulas (2.3-2.5) Random number generator see proposition (4)

Value

The function returns the value of the probability density function for the Sulewski plasticizing component distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P., Volodin, A. (2022). *Sulewski Plasticizing Component Distribution: properties and applications.* Lobachtetavskii Journal of Mathtetamatics 43(8), 2286-2300.

Examples

```
dspc(0,1,1,1,1,0)
pspc(0,1,1,1,1,0)
qspc(0.5,1,1,1,1,0)
rspc(10,1,1,1,1,0)
```

`dtppn` *Two-Piece Power Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the two-piece power normal distribution with parameters teta, s1, s2 and c.

Usage

```
dtppn(x, teta, s1, s2, c)
```

Arguments

`x`	real argument
`teta`	position parameter
`s1`	positive scale parameter
`s2`	positive scale parameter
`c`	shape parameter (c>=1)

Details

Probability density function see formula (4) in the article Cumulative distribution function see formula (5) Quantile functon see formula (10) Random number generator see formula (21)

Value

The function returns the value of the probability density function for the two-piece power normal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2021). *Two-Piece Power Normal Distribution,* Communications in Statistics - Theory and Method 50(11), 2619-2639.

Examples

```
dtppn(2,1,1,1,2)
ptppn(2,1,1,1,2)
qtppn(0.5,1,1,1,2)
rtppn(10,1,1,1,2)
```

---

pdsn *DS Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the DS normal distribution with parameters a, b, c and d.

Usage

```
pdsn(x, a, b, c, teta)
```

Arguments

x	real argument
a	non-negative multipurpose parameter and a+b>0
b	non-negative multipurpose parameter and a+b>0
c	real multipurpose parameter
teta	real position parameter

Details

Probability density function in Latex see formula (5) in the paper Cumulative distribution function in Latex see formula (6) Quantile function see formulas (8,9,10) Random number generator see Theorem (5)

Value

The function returns the value of the cumulative distribution function for the DS normal distribution

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski P. (2021). *DS Normal Distribution: properties and applications.* Lobachevskii Journal of Mathematics 42(12), 2980-2999.

Examples

```
ddsn(-0.5,2,2,2,0)
pdsn(-0.5,2,2,2,0)
qdsn(0.5,2,2,2,0)
rdsn(10,2,2,2,0)
```

`peck` *Easily Changeable Kurtosis Distribution*

Description

Density, distribution function, quantile function and random generation for the Easily Changeable Kurtosis Distribution with parameters a and p.

Usage

```
peck(x, a, p)
```

Arguments

x	-a<x<a for -1<p<0 or -a<=x<=a for p>=1
a	positive scale parameter
p	shape parameter: p>-1

Details

Probability density function see formula (1) or (3) in the article Cumulative distribution function see formula (4) Quantile functon see formula (20) Random number generator see formula (41)

Value

The function returns the value of the cumulative distribution function for the Easily Changeable Kurtosis Distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *Easily Changeable Kurtosis Distribution.* Austrian Journal of Statistics 52, 1-24.

Examples

```
deck(1,2,3)
peck(1,2,3)
qeck(0.5,2,3)
reck(10,2,3)
```

---

pen *Expnormal Distribution*

Description

Density, distribution function, quantile function and random generation for the Expnormal distribution with parameters a1, b1, a2, b2 and c.

Usage

```
pen(x, a1, b1, a2, b2, c)
```

Arguments

x	real argument
a1	position parameter
b1	positive scale parameter
a2	position parameter
b2	positive scale parameter
c	semi-fraction parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.3) Quantile functon see proposition (2.2) Random number generator see proposition (2.6)

Value

The function returns the value of the cumulative distribution function for the Expnormal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *New Members of The Johnson Family of Probability Distributions:Properties and Application,* Accepted: February 2022. REVSTAT-Statistical Journal.

Examples

```
den(1,1,2,2,2,1)
pen(1,1,2,2,2,1)
qen(0.5,1,2,2,2,1)
ren(10,1,2,2,2,1)
```

---

ppc *Plasticizing Component*

Description

Density, distribution function, quantile function and random generation for the plasticizing component with parameters teta, s2 and c.

Usage

```
ppc(x, teta, s2, c)
```

Arguments

x	real argument
teta	position parameter
s2	positive scale parameter
c	shape parameter (c>=1)

Details

Probability density function see formula (2) in the article Cumulative distribution function see formula (4) Quantile functon see formula (9) Random number generator see formula (23)

Value

The function returns the value of the cumulative distribution function for the plasticizing component.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2020). *Normal Distribution with Plasticizing Component,* Communications in Statistics ? Theory and Method 51(11), 3806-3835.

Examples

```
dpc(0,1,2,2)
ppc(0,1,2,2)
qpc(0.5,1,2,2)
rpc(10,1,2,2)
```

PSDistr *The list of package functions and their demonstration*

Description

The **PSDistr** presents the following distribution derived from the normal distribution: two-piece power normal (TPPN), plasticizing component (PC), DS normal (DSN), expnormal (EN), Sulewski plasticizing component (SPC), easily changeable kurtosis (ECK) distributions. Density, distribution function, quantile function and random generation are presented. The list of package functions is as follows:

Functions for the two-piece power normal distribution

dtppn

ptppn

qtppn

rtppn

Functions for the plasticizing component distribution

dpc

ppc

qpc

rpc

Functions for the DS normal distribution

ddsn

pdsn

qdsn

rdsn

#' @section Functions for the expnormal distribution:

den

pen

qen

ren

#' @section Functions for the Sulewski plasticizing component distribution:

dspc

pspc

qspc

rspc

#' @section Functions for the easily changeable kurtosis distribution:

deck

peck

qeck

reck

---

pspc *Sulewski Plasticizing Component Distribution*

Description

Density, distribution function, quantile function and random generation for the Sulewski plasticizing component distribution with parameters a, b, c, d and teta.

Usage

```
pspc(x, a, b, c, d, teta)
```

Arguments

x	real argument
a	multipurpose parameter (a>=0)
b	multipurpose parameter (b>=0, a+b>0)
c	multipurpose parameter
d	multipurpose parameter (d>=1)
teta	position parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.2) Quantile functon see formulas (2.3-2.5) Random number generator see proposition (4)

Value

The function returns the value of the cumulative distribution function for the Sulewski plasticizing component distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P., Volodin, A. (2022). *Sulewski Plasticizing Component Distribution: properties and applications.* Lobachtetavskii Journal of Mathtetamatics 43(8), 2286-2300.

Examples

```
dspc(0,1,1,1,1,0)
pspc(0,1,1,1,1,0)
qspc(0.5,1,1,1,1,0)
rspc(10,1,1,1,1,0)
```

---

ptppn *Two-Piece Power Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the two-piece power normal distribution with parameters teta, s1, s2 and c.

Usage

```
ptppn(x, teta, s1, s2, c)
```

Arguments

x	real argument
teta	position parameter
s1	positive scale parameter
s2	positive scale parameter
c	shape parameter (c>=1)

Details

Probability density function see formula (4) in the article Cumulative distribution function see formula (5) Quantile functon see formula (10) Random number generator see formula (21)

Value

The function returns the value of the cumulative distribution function for the two-piece power normal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2021). *Two-Piece Power Normal Distribution,* Communications in Statistics - Theory and Method 50(11), 2619-2639.

Examples

```
dtppn(2,1,1,1,2)
ptppn(2,1,1,1,2)
qtppn(0.5,1,1,1,2)
rtppn(10,1,1,1,2)
```

---

qdsn *DS Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the DS normal distribution with parameters a, b, c and d.

Usage

```
qdsn(p, a, b, c, teta)
```

Arguments

p	probability between 0 and 1
a	non-negative multipurpose parameter and a+b>0
b	non-negative multipurpose parameter and a+b>0
c	real multipurpose parameter
teta	real position parameter

Details

Probability density function in Latex see formula (5) in the paper Cumulative distribution function in Latex see formula (6) Quantile function see formulas (8,9,10) Random number generator see Theorem (5)

Value

The function returns the value of the quantile function for the DS normal distribution

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski P. (2021). *DS Normal Distribution: properties and applications.* Lobachevskii Journal of Mathematics 42(12), 2980-2999.

Examples

```
ddsn(-0.5,2,2,2,0)
pdsn(-0.5,2,2,2,0)
qdsn(0.5,2,2,2,0)
rdsn(10,2,2,2,0)
```

---

qeck *Easily Changeable Kurtosis Distribution*

Description

Density, distribution function, quantile function and random generation for the Easily Changeable Kurtosis Distribution with parameters a and p.

Usage

```
qeck(q, a, p)
```

Arguments

q	probability between 0 and 1
a	positive scale parameter
p	shape parameter: p>-1

Details

Probability density function see formula (1) or (3) in the article Cumulative distribution function see formula (4) Quantile functon see formula (20) Random number generator see formula (41)

Value

The function returns the value of the quantile function for the Easily Changeable Kurtosis Distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *Easily Changeable Kurtosis Distribution.* Austrian Journal of Statistics 52, 1-24.

Examples

```
deck(1,2,3)
peck(1,2,3)
qeck(0.5,2,3)
reck(10,2,3)
```

---

qen *Expnormal Distribution*

Description

Density, distribution function, quantile function and random generation for the Expnormal distribution with parameters a1, b1, a2, b2 and c.

Usage

```
qen(p, a1, b1, a2, b2, c)
```

Arguments

p	probability between 0 and 1
a1	position parameter
b1	positive scale parameter
a2	position parameter
b2	positive scale parameter
c	semi-fraction parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.3) Quantile functon see proposition (2.2) Random number generator see proposition (2.6)

Value

The function returns the value of the quantile function for the Expnormal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *New Members of The Johnson Family of Probability Distributions:Properties and Application,* Accepted: February 2022. REVSTAT-Statistical Journal.

Examples

```
den(1,1,2,2,2,1)
pen(1,1,2,2,2,1)
qen(0.5,1,2,2,2,1)
ren(10,1,2,2,2,1)
```

---

qpc *Plasticizing Component*

Description

Density, distribution function, quantile function and random generation for the plasticizing component with parameters teta, s2 and c.

Usage

```
qpc(p, teta, s2, c)
```

Arguments

p	probability between 0 and 1
teta	position parameter
s2	positive scale parameter
c	shape parameter (c>=1)

Details

Probability density function see formula (2) in the article Cumulative distribution function see formula (4) Quantile functon see formula (9) Random number generator see formula (23)

Value

The function returns the value of the quantile function for the plasticizing component.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

SSulewski, P. (2020). *Normal Distribution with Plasticizing Component,* Communications in Statistics ? Theory and Method 51(11), 3806-3835.

Examples

```
dpc(0,1,2,2)
ppc(0,1,2,2)
qpc(0.5,1,2,2)
rpc(10,1,2,2)
```

---

qspc *Sulewski Plasticizing Component Distribution*

Description

Density, distribution function, quantile function and random generation for the Sulewski plasticizing component distribution with parameters a, b, c, d and teta.

Usage

```
qspc(p, a, b, c, d, teta)
```

Arguments

p	probability between 0 and 1
a	multipurpose parameter (a>=0)
b	multipurpose parameter (b>=0, a+b>0)
c	multipurpose parameter
d	multipurpose parameter (d>=1)
teta	position parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.2) Quantile functon see formulas (2.3-2.5) Random number generator see proposition (4)

Value

The function returns the value of the quantile function for the Sulewski plasticizing component distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P., Volodin, A. (2022). *Sulewski Plasticizing Component Distribution: properties and applications.* Lobachtetavskii Journal of Mathtetamatics 43(8), 2286-2300.

Examples

```
dspc(0,1,1,1,1,0)
pspc(0,1,1,1,1,0)
qspc(0.5,1,1,1,1,0)
rspc(10,1,1,1,1,0)
```

---

qtppn *Two-Piece Power Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the two-piece power normal distribution with parameters teta, s1, s2 and c.

Usage

```
qtppn(p, teta, s1, s2, c)
```

Arguments

p	probability between 0 and 1
teta	position parameter
s1	positive scale parameter
s2	positive scale parameter
c	shape parameter (c>=1)

Details

Probability density function see formula (4) in the article Cumulative distribution function see formula (5) Quantile functon see formula (10) Random number generator see formula (21)

Value

The function returns the value of the quantile function for the two-piece power normal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2021). *Two-Piece Power Normal Distribution,* Communications in Statistics - Theory and Method 50(11), 2619-2639.

Examples

```
dtppn(2,1,1,1,2)
ptppn(2,1,1,1,2)
qtppn(0.5,1,1,1,2)
rtppn(10,1,1,1,2)
```

`rdsn` *DS Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the DS normal distribution with parameters a, b, c and d.

Usage

```
rdsn(n, a, b, c, teta)
```

Arguments

`n`	positive number of observations
`a`	non-negative multipurpose parameter and a+b>0
`b`	non-negative multipurpose parameter and a+b>0
`c`	real multipurpose parameter
`teta`	real position parameter

Details

Probability density function in Latex see formula (5) in the paper Cumulative distribution function in Latex see formula (6) Quantile function see formulas (8,9,10) Random number generator see Theorem (5)

Value

The function returns random generator values for the DS normal distribution

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski P. (2021). *DS Normal Distribution: properties and applications.* Lobachevskii Journal of Mathematics 42(12), 2980-2999.

Examples

```
ddsn(-0.5,2,2,2,0)
pdsn(-0.5,2,2,2,0)
qdsn(0.5,2,2,2,0)
rdsn(10,2,2,2,0)
```

---

reck *Easily Changeable Kurtosis Distribution*

Description

Density, distribution function, quantile function and random generation for the Easily Changeable Kurtosis Distribution with parameters a and p.

Usage

```
reck(n, a, p)
```

Arguments

n	positive number of observations
a	positive scale parameter
p	shape parameter: p>-1

Details

Probability density function see formula (1) or (3) in the article Cumulative distribution function see formula (4) Quantile functon see formula (20) Random number generator see formula (41)

Value

The function returns random generation values for the Easily Changeable Kurtosis Distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *Easily Changeable Kurtosis Distribution.* Austrian Journal of Statistics 52, 1-24.

Examples

```
deck(1,2,3)
peck(1,2,3)
qeck(0.5,2,3)
reck(10,2,3)
```

---

ren *Expnormal Distribution*

Description

Density, distribution function, quantile function and random generation for the Expnormal distribution with parameters a1, b1, a2, b2 and c.

Usage

```
ren(n, a1, b1, a2, b2, c)
```

Arguments

n	positive number of observations
a1	position parameter
b1	positive scale parameter
a2	position parameter
b2	positive scale parameter
c	semi-fraction parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.3) Quantile functon see proposition (2.2) Random number generator see proposition (2.6)

Value

The function returns random generator values for the Expnormal distribution

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2022). *New Members of The Johnson Family of Probability Distributions:Properties and Application,* Accepted: February 2022. REVSTAT-Statistical Journal.

Examples

```
den(1,1,2,2,2,1)
pen(1,1,2,2,2,1)
qen(0.5,1,2,2,2,1)
ren(10,1,2,2,2,1)
```

---

rpc *Plasticizing Component*

Description

Density, distribution function, quantile function and random generation for the plasticizing component with parameters teta, s2 and c.

Usage

```
rpc(n, teta, s2, c)
```

Arguments

n	positive number of observations
teta	position parameter
s2	positive scale parameter
c	shape parameter (c>=1)

Details

Probability density function see formula (2) in the article Cumulative distribution function see formula (4) Quantile functon see formula (9) Random number generator see formula (23)

Value

The function returns random generator values for the plasticizing component.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2020). *Normal Distribution with Plasticizing Component,* Communications in Statistics ? Theory and Method 51(11), 3806-3835.

Examples

```
dpc(0,1,2,2)
ppc(0,1,2,2)
qpc(0.5,1,2,2)
rpc(10,1,2,2)
```

---

rspc *Sulewski Plasticizing Component Distribution*

Description

Density, distribution function, quantile function and random generation for the Sulewski plasticizing component distribution with parameters a, b, c, d and teta.

Usage

```
rspc(n, a, b, c, d, teta)
```

Arguments

n	positive number of observations
a	multipurpose parameter (a>=0)
b	multipurpose parameter (b>=0, a+b>0)
c	multipurpose parameter
d	multipurpose parameter (d>=1)
teta	position parameter

Details

Probability density function see formula (2.1) in the article Cumulative distribution function see formula (2.2) Quantile functon see formulas (2.3-2.5) Random number generator see proposition (4)

Value

The function returns random generator values for the Sulewski plasticizing component distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P., Volodin, A. (2022). *Sulewski Plasticizing Component Distribution: properties and applications.* Lobachtetavskii Journal of Mathtetamatics 43(8), 2286-2300.

Examples

```
dspc(0,1,1,1,1,0)
pspc(0,1,1,1,1,0)
qspc(0.5,1,1,1,1,0)
rspc(10,1,1,1,1,0)
```

`rtppn` *Two-Piece Power Normal Distribution*

Description

Density, distribution function, quantile function and random generation for the two-piece power normal distribution with parameters teta, s1, s2 and c.

Usage

```
rtppn(n, teta, s1, s2, c)
```

Arguments

`n`	positive number of observations
`teta`	position parameter
`s1`	positive scale parameter
`s2`	positive scale parameter
`c`	shape parameter (c>=1)

Details

Probability density function see formula (4) in the article Cumulative distribution function see formula (5) Quantile functon see formula (10) Random number generator see formula (21)

Value

The function returns random generator values for the two-piece power normal distribution.

Author(s)

Piotr Sulewski, <piotr.sulewski@upsl.edu.pl>, Pomeranian UNiwersity in Slupsk.

References

Sulewski, P. (2021). *Two-Piece Power Normal Distribution,* Communications in Statistics - Theory and Method 50(11), 2619-2639.

Examples

```
dtppn(2,1,1,1,2)
ptppn(2,1,1,1,2)
qtppn(0.5,1,1,1,2)
rtppn(10,1,1,1,2)
```

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