

Package ‘triangle’

February 20, 2015

Type Package

Title Provides the standard distribution functions for the triangle distribution

Version 0.8

Date 2013-02-21

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Depends R (>= 2.14.1)

Description Provides the ``r, q, p, and d'' distribution functions for the triangle distribution

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Repository CRAN

Repository/R-Forge/Project triangledist

Repository/R-Forge/Revision 4

Repository/R-Forge/DateTimeStamp 2013-02-21 19:35:32

Date/Publication 2013-02-22 08:23:41

NeedsCompilation no

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ltriangle

The Logarithmic Triangle Distribution

Description

These functions provide information about the triangle distribution on the logarithmic interval from a to b with a maximum at c. `dltriangle` gives the density, `pltriangle` gives the distribution function, `qltriangle` gives the quantile function, and `rltriangle` generates n random deviates.

Usage

```
dltriangle(x, a=1, b=100, c=10^((log10(a)+log10(b))/2), logbase=10)
pltriangle(q, a=1, b=100, c=10^((log10(a)+log10(b))/2), logbase=10)
qltriangle(p, a=1, b=100, c=10^((log10(a)+log10(b))/2), logbase=10)
rltriangle(n=1, a=1, b=100, c=10^((log10(a)+log10(b))/2), logbase=10)
```

Arguments

x, q	vector of quantiles.
p	vector of probabilities.
a	lower limit of the distribution.
b	upper limit of the distribution.
c	mode of the distribution.
n	number of observations. If <code>length(n) > 1</code> , the length is taken to be the number required.
logbase	the base of the logarithm to use.

Details

All probabilities are lower tailed probabilities.

a, b, and c may be appropriate length vectors except in the case of `rltriangle`.

Value

`dltriangle` gives the density, `pltriangle` gives the distribution function, `qltriangle` gives the quantile function, and `rltriangle` generates random deviates.

Invalid arguments will result in return value NaN or NA.

Author(s)

Rob Carnell

References

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole.

See Also

[.Random.seed](#) about random number generation, [runif](#), etc for other distributions.

Examples

```
## view the distribution
tri <- rtriangle(100000, 1, 100, 10)
hist(log10(tri), breaks=100, main="Triangle Distribution", xlab="x")

dtriangle(10, 1, 100, 10) # 2/(log10(b)-log10(a)) = 1

qltriangle(pltriangle(10)) # 10
```

triangle

The Triangle Distribution

Description

These functions provide information about the triangle distribution on the interval from a to b with a maximum at c . `dtriangle` gives the density, `ptriangle` gives the distribution function, `qtriangle` gives the quantile function, and `rtriangle` generates n random deviates.

Usage

```
dtriangle(x, a=0, b=1, c=(a+b)/2)
ptriangle(q, a=0, b=1, c=(a+b)/2)
qtriangle(p, a=0, b=1, c=(a+b)/2)
rtriangle(n, a=0, b=1, c=(a+b)/2)
```

Arguments

<code>x, q</code>	vector of quantiles.
<code>p</code>	vector of probabilities.
<code>a</code>	lower limit of the distribution.
<code>b</code>	upper limit of the distribution.
<code>c</code>	mode of the distribution.
<code>n</code>	number of observations. If <code>length(n) > 1</code> , the length is taken to be the number required.

Details

All probabilities are lower tailed probabilities.

`a`, `b`, and `c` may be appropriate length vectors except in the case of `rtriangle`.

`rtriangle` is derived from a draw from `runif`.

The triangle distribution has density:

$$f(x) = \frac{2(x-a)}{(b-a)(c-a)}$$

for $a \leq x < c$.

$$f(x) = \frac{2(b-x)}{(b-a)(b-c)}$$

for $c \leq x \leq b$. $f(x) = 0$ elsewhere.

The mean and variance are:

$$E(x) = \frac{(a+b+c)}{3}$$

$$V(x) = \frac{1}{18}(a^2 + b^2 + c^2 - ab - ac - bc)$$

Value

`dtriangle` gives the density, `ptriangle` gives the distribution function, `qtriangle` gives the quantile function, and `rtriangle` generates random deviates.

Invalid arguments will result in return value NaN or NA.

Author(s)

Rob Carnell

References

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole.

See Also

[.Random.seed](#) about random number generation, [runif](#), etc for other distributions.

Examples

```
## view the distribution
tri <- rtriangle(100000, 1, 5, 3)
hist(tri, breaks=100, main="Triangle Distribution", xlab="x")

mean(tri) # 1/3*(1 + 5 + 3) = 3
var(tri) # 1/18*(1^2 + 3^2 + 5^2 - 1*5 - 1*3 - 5*3) = 0.666667

dtriangle(0.5, 0, 1, 0.5) # 2/(b-a) = 2

qtriangle(ptriangle(0.7)) # 0.7
```

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