Package 'triangle'

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Type Package

Title Provides the standard distribution functions for the triangle distribution

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Depends R (>= 2.0.1)

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

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R topics documented:

`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(q, a=0, b=1, c=0.5)
ptriangle(q, a=0, b=1, c=0.5)
qtriangle(p, a=0, b=1, c=0.5)
rtriangle(n, a=0, b=1, c=0.5)
```

Arguments

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 `length(n) > 1`, the length is taken to be the number required.

Details

All probabilities are lower tailed probabilties.

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 `rtraingle` 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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