

# 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

**License** GPL (>= 2)

**Repository** CRAN

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triangle	<i>The Triangle Distribution</i>
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## 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)
qttriangle(p, a=0, b=1, c=0.5)
rttriangle(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 <code>length(n) &gt; 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 `rttriangle`.

`rttriangle` 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, `qttriangle` gives the quantile function, and `rttriangle` 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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