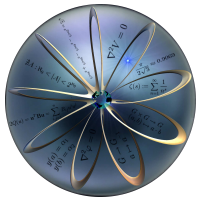

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beta random variable

Canonical name	BetaRandomVariable
Date of creation	2013-03-22 11:54:30
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Entry type	Definition
Classification	msc 60-00
Synonym	beta distribution

X is a **beta random variable** with parameters **a and b** if

$f_X(x) = \frac{x^{a-1}(1-x)^{b-1}}{\beta(a,b)}$, $x \in [0,1]$

Parameters:

- $a > 0$
- $b > 0$

Syntax:

$X \sim Beta(a,b)$

Notes:

1. X is used in many statistical models.
2. The function $\beta : R \times R \to R$ is defined as $\beta(a,b) = \int_0^1 x^{a-1}(1-x)^{b-1}dx$. $\beta(a,b)$ can be calculated as $\beta(a,b) = \frac{\Gamma(a)\Gamma(b)}{\Gamma(a+b)}$ (For information on the Γ function, see the gamma random variable)
3. $E[X] = \frac{a}{a+b}$
4. $Var[X] = \frac{ab}{(a+b+1)(a+b)^2}$
5. $M_X(t)$ not useful