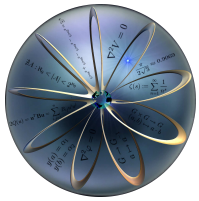

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cumulant generating function

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Given a random variable X, the *cumulant generating function* of X is the following function:

$$H_X(t) = \ln E[e^{tX}]$$

for all $t \in R$ in which the expectation converges.

In other , the cumulant generating function is just the logarithm of the moment generating function.

The cumulant generating function of X is defined on a (possibly degenerate) interval containing $t = 0$; one has $H_X(0) = 0$; moreover, $H_X(t)$ is a `http://planetmath.org/ConvexFunction`convex function. (Indeed, the moment generating function is defined on a possibly degenerate interval containing $t = 0$, which image is a positive interval containing $t = 1$; so the logarithm is defined on the same interval on which is defined the moment generating function.)

The kth-derivative of the cumulant generating function evaluated at zero is the kth cumulant of X.