



# MOMENT GENERATING FUNCTION

## Why

TODO

## Results

The *moment generating function* of a real-valued random variable is the function mapping real numbers to the expectation of the exponential of the product of that real number with the random variable.

## Notation

Let  $(X, \mathcal{A}, \mu)$  be a probability space. Let  $f$  be a real-valued random variable on  $X$ . Let  $R$  denote the real numbers. For each  $t \in R$ , denote by  $tf$  the function  $x \mapsto tf(x)$ . Similarly, denote by  $e^{tf}$  the function  $x \mapsto e^{tf(x)}$ .

Denote the moment generating function of  $f$  by  $m_f : R \rightarrow R$ . We defined it by

$$m_f(t) = \mathbf{E}(e^{tf}).$$

