Glossary

Random Variable - A random variable is an assignment of numbers to possible outcomes of a random experiment
Discrete random variable - A discrete random variable is one whose set of possible values is countable
continuous random variable - A quantitative random variable is *continuous* if its set of possible values is uncountable
Moment generating function - the **moment-generating function** of a random variable *X* is $M_X(t) = E[e^{tx}]$, for $t \in R$
wherever this expectation exists.
uniqueness theorem - The Uniqueness explains moment generating functions uniquely defines the probability distribution of a function of random variables.
probability distribution - The probability distribution of a random variable specifies the chance that the variable takes a value in any subset of the real numbers. The probability distribution of a random variable is completely characterized by the cumulative probability distribution function
probability density function - The chance that a continuous random variable is in any range of values can be calculated as the area under a curve over that range of values. The curve is the probability density function of the random variable. That is, if X is a continuous random variable, there is a function *f*(x) such that for every pair of numbers $a \le b$, $P(a \le X \le b)$ = (area under *f* between *a* and *b*); *f* is the probability density function of X
Distribution - The distribution of a set of numerical data is how their values are distributed over the real numbers
Distribution function - The empirical (cumulative) distribution function of a set of numerical data is, for each real value of *x*, the fraction of observations that are less than or equal to *x*
joint probability distribution - If $X_1, X_2, \ldots, X_k$ are random variables defined for the same experiment, their *joint probability distribution* gives the probability of events determined by the collection of random variables: for any collection of sets of numbers $\{A_1, \ldots, A_k\}$, the joint probability distribution determines P((X_1 is in A_1) and (X_2 is in A_2) and … and (X_k is in A_k)).

Transformation technique – Transformations technique turn set of variables into other set of random variables variables.
jacobian - an mathematical term used when changing variables to simplify a region or an integrand.