**Definition 3.10**

A random variable Y is said to have a hypergeometric probability distribution if and only if

**Definition 3.11**

A random variable Y is said to have a Poisson probability distribution if and only if

**Definition 3.15**

Let Y be an integer-valued random variable for which where The probability-generating function P (t) for Y is defined to be

**Definition 3.16**

The kth factorial moment for a random variable Y is defined to be

**Definition 4.3**

Let F(y) be the distribution function for a continuous random variable Y. Then f (y), given by

**Definition 4.5**

The expected value of a continuous random variable Y is

**Definition 4.6**

**Definition 4.8**

A random variable Y is said to have a normal probability distribution if and only if, for the density unction of Y is

**Definition 4.9**

**Definition 4.11**

A random variable Y is said to have an exponential distribution with parameter β > 0 if and only if the density function of Y is

**Definition 4.12**

**Definition 4.13**

If Y is a continuous random variable, then the kth moment about the origin is given by

**Definition 4.14**

If Y is a continuous random variable, then the moment-generating function of Y is given by

**Theorem 3.10**

If Y is a random variable with a hypergeometric distribution

**Theorem 3.11**

If Y is a random variable possessing a Poisson distribution with parameter λ, then

**Theorem 3.12**

If m(t) exists, then for any positive integer k

**Theorem 3.13**

If P(t) is the probability-generating function for an integer-valued random variable, Y , then the kth factorial moment of Y is given by

**Theorem 3.14**

Tchebysheff’s Theorem Let Y be a random variable with mean μ and finite variance σ2. Then, for any constant k > 0

**Theorem 4.3**

If the random variable Y has density function f (y) and a < b, then the probability that Y falls in the interval [a, b] is

**Theorem 4.4**

Let g(Y ) be a function of Y ; then the expected value of g(Y ) is given by

**Theorem 4.6**

If and Y is a random variable uniformly distributed on the interval (), then

**Theorem 4.8**

If Y has a gamma distribution with parameters α and β, then

**Theorem 4.9**

If Y is a chi-square random variable with ν degrees of freedom, then

**Theorem 4.10**

If Y is an exponential random variable with parameter β, then

**Theorem 4.11**

If Y is a beta-distributed random variable with parameters α > 0 and β > 0, then

**Theorem 4.12**

Let Y be a random variable with density function f (y) and g(Y ) be a function of Y . Then the moment-generating function for g(Y ) is

**Theorem 4.13**

Tchebysheff’s Theorem Let Y be a random variable with finite mean μ and variance σ2. Then, for any k > 0,