

STAT 437

FORMULA SHEET

1. If X is $N(\mu, \sigma^2)$ then $M_X(r) = E(e^{Xr}) = e^{\mu r + \sigma^2 r^2 / 2}$.
2. If X has p.d.f. $f(x) = \lambda e^{-\lambda x}$, then $M_X(r) = \frac{\lambda}{\lambda - r}$, $r < \lambda$.
3. If $S = X_1 + X_2 + \cdots + X_N$, X_i are i.i.d. and independent of N

$$\text{then } M_s(t) = M_N(\ln M_X(t))$$

$$E(S) = E(N)E(X)$$

$$\text{var}S = (E(X))^2 \text{var}N + E(N)\text{var}X$$

4. $M_{L_1}(r) = (M_X(r) - 1)/p_1 r$

5. $M_L(r) = \frac{\theta p_1 r}{1 - M_X(r) + (1 + \theta)p_1 r}$

6. $c = \lambda p_1 (1 + \theta)$

7. $\int_0^\infty e^{ur} [-\psi'(u)] du = \frac{\theta}{1 + \theta} \frac{M_X(r) - 1}{(1 - M_X(r) + (1 + \theta)p_1 r)}$