AMS 569 - Final/Last Homework #7

Due , Thursday May 10, 2001, 4.30 pm

Important: this exam is individual work.
You are allowed to work in the library, consult books, etc.
Please do not consult with any other 'live' person.
Questions, in case something is obscure, should be addressed in class, office hours, or by email to folkert@cybeready.com and yingjie@ams.sunysb.edu.

1. Present a complete proof of Lemma 6.16 in Karr, page 172.

2. Present a complete proof of Lemma 9.24 in Karr, page 256.

3. Let $N(t)$ be a Poisson counting process with Poisson rate λ. Let $Y_{k,\lambda,c}(t) = kN(t) - ct$. Let μ and σ be given. Let γ be a parameter, and let (k, λ, c) be given in terms of μ, σ, γ by the following formulae:

$$\begin{aligned} k &= \frac{\gamma}{\sigma^2} \\ \lambda &= \frac{\sigma^6}{\gamma^2} \\ c &= \frac{\sigma^4}{\gamma} - \mu \end{aligned}$$

Show that as $\gamma \to 0$ $Y_{k,\lambda,c}(t)$ converges in distribution to the normal distibution $N(\mu t, \sigma^2 t)$ (mean μt and variance $\sigma^2 t$).

4. Karr, Problems 4.28, 4.29 (page 132).

5. Karr, Problem 5.19 (page 161).

6. Karr, Problem 8.13 (page 240).

7. Karr, Problem 9.16 (page 270).

8. Karr, Problem 9.11 (page 269).