Math 151, Spring 2011
Jo Hardin, HW #11

Homework due on THURSDAY, APRIL 7^{th}, START OF CLASS.

1. DeGroot (3^{rd} or 4^{th} ed.), section 4.4: # 3, 4, 6, 9, 12

2. DeGroot (3^{rd} or 4^{th} ed.), section 4.6: # 3, 5, 6, 10

3. Let X and Y be identically distributed independent random variables such that the mgf of X+Y is:

$$M(t) = 0.09e^{-2t} + 0.24e^{-t} + 0.34 + 0.24e^{t} + 0.09e^{2t} \quad -\infty < t < \infty$$

   Calculate $P(X \leq 0)$.

4. We can show that for $Y = g(X)$ (some nonlinear function)

$$E(Y) \approx g(\mu_X) + \frac{1}{2}\sigma_x^2 g''(\mu_X)$$

   (through a Taylor series expansion of g about μ_X).

   Let $Y = g(X) = \sqrt{X}$, and consider two cases: $X \sim Unif(0,1)$ and $X \sim Unif(1,2)$. (Note: you can look up the mean and variance of a uniform in the back cover of your book.)

   For which distribution is the approximation better? Explain.