Stat 121 (Mathematical Statistics I)

Problem Set No. 6

Instruction: Answer the following as indicated.

1. Show that the moment generating function of a random variable Y having a uniform distribution over the interval (θ_1, θ_2) is

$$m_Y(t) = \begin{cases} \frac{e^{\theta_2 t} - e^{\theta_1 t}}{t(\theta_2 - \theta_1)}, \ t \neq 0 \\ 1, \ t = 0 \end{cases}$$

2. In a certain pediatric population, systolic blood pressure is normally distributed with mean 115 mm Hg and standard deviation 10 mm Hg. :

   a. Find the probability that a randomly selected child from this population will have a systolic pressure greater than 125 mm Hg.

   b. Find the probability that a randomly selected child from this population will havea systolic pressure less than 95 mm Hg.

   c. What is the systolic pressure below which 95% of this population lies.