Math 350 Probability − Quiz 5 − Fall 2007

Name: _____

Instructions:**Answer each question completely and show all work.**

1. Suppose X is a discrete random variable with moment generating function given by:

$$M_X(t) = \left((.4)e^t + (.6)\right)^3 \exp\left(2(e^t - 1)\right)$$

Find:

(a) $\mathrm{P}(X = 1)$

(b) $\mathrm{E}(X)$ (Hint: Do not take any derivatives)

(c) $\mathrm{Var}(X)$

2. Suppose a company with 40 employees has a gift exchange where each person puts a gift into a pile. Once all the gifts have been placed in the pile, each person is given a gift at random. What is the expected number of people that receive their own gift back?

3. Suppose in the problem above each person puts in two gifts and gets two gifts back. What is the expected number of people who get back at least one of their gifts?