Mathematics 170A – HW5 – Due Tuesday, February 14, 2012.

Problems 15,16,18,20,23 on pages 122-124.

G_1. Let n be a positive integer, and let

$$p(k) = \begin{cases} ck & \text{if } k = 1, 2, ..., n; \\ 0 & \text{otherwise.} \end{cases}$$

(a) What choice of c makes this into a PMF?
(b) Compute the mean of this PMF.

G_2. Suppose X has the $B(4, p)$ distribution. Find $E \sin(\pi X/2)$.

G_3. Let X be Poisson with parameter λ. Find $E(1 + X)^{-1}$.

G_4. Suppose that X is a random variable that takes only nonnegative integer values. Show that

$$EX = \sum_{k=1}^{\infty} P(X \geq k).$$

(Suggestion: rewrite either side as a double sum, and interchange the order of summation. This interchange is permissible whenever the summands are nonnegative.)

G_5. Use the result in problem G_4 above to compute the mean of the geometric distribution with parameter p.