Homework 8

Book problems: 4.3, 4.12, 4.13, 4.14, 4.16, 4.17

A particle moves on a circle through points which have been marked 0, 1, 2, 3, 4 (in clockwise order). At each step it has probability $p$ of moving to the right (clockwise) and $(1 - p)$ to the left (counterclockwise). Let $X_n$ denote its location on the circle after the $n^{th}$ step. The process $\{X_n, n \geq 0\}$ is a Markov chain.

(a) Find the transition probability matrix.

(b) Calculate the limiting probabilities.