Tutorial/Recitation 9: Solutions

1. Problem 7.1, page 380 in textbook. See online solutions.

2. (a) Recurrent: 1, 2, 4, 5 , 6; Transient: 3; Periodic: 4,5,6.
   (b) 0.2^n
   (c) This is a geometric random variable with parameter $p = 0.5 + 0.3$. Hence, the expected number of trials up to and includ ing the trial on which the process leaves state 3 is $\mathbf{E}[X] = 1/p = 5/4$.
   (d) 3/8
   (e) $\mathbf{P}(A) = 0.3 + 0.2^3 0.3 + 0.2^6 0.3 + 0.2^9 0.3 = 0.3024$.
   (f) $0.3/\mathbf{P}(A) = 0.992$.

3. Problem 7.13, page 385 in textbook. See online solutions.

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