NCAA lecture 7: quiz solutions

1) b), c), d), e) and f) are all correct!
   a factor $\frac{1}{2}$ is missing in a)

   Subsidiary question: yes, when $p_0 = 1$ and $V_1 = 1$ or the opposite

2) a) $\Pi P^n_0 - \Pi U_{V^n} = |P_{00}^n| - \overline{U}_0 = \frac{p}{p+q} (1-p-q)^n$
   
   so this is equal to zero but $>1$ iff $p+q = 1$ (answer c)
   (In this case, the chain is in equilibrium after one step already)

   b) It is never the case that a cut-off phenomenon
   is observed: always an exponential decrease (or all zero).
      (if $p+q = 1$)