

## MCAA 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  $\mu_0 = 1$  and  $\nu_1 = 1$  or the opposite

$$2) a) \|P_0^n - \pi\|_{TV} = |P_{00}^{(n)} - \pi_0| = \frac{p}{p+q} (1-p-q)^n$$

so this is equal to zero  $\forall n \geq 1$  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  $p+q=1$ .