



• The video discusses how to model the process of waiting for a random event to occur using the theory of Markov chains. Draw a transition graph for this random process.

• Write out the jump rate matrix that should be used within the Kolmogorov equation in order to construct this particular random model.

• The amount of time that we have to wait for the event to occur for is a random variable, T. Explain how P(T > t) can be derived starting from the Kolmogorov equation.

• The random variable that is described in this video (the one I called T in the previous question) is known as the exponential random variable. Write out expressions for the cumulative probability distribution  $F_T(t)$  for this random variable and the probability density  $f_T(t)$ .



• Explain what it means when we state that a random variable has no memory. Reproduce the derivation from the video that shows that the exponential random variable has this property.