



**MathsNET**

A joined up approach to  
teaching and learning  
mathematics

# Gamblers ruin

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- Draw the transition graph for the gamblers ruin.
- Write out the one-step transition matrix for the gamblers ruin problem.
- On the transition graph that you wrote out in the first of these questions highlight the recurrent states.
- Explain what the symbol  $\pi_k$  is used to represent in the video and then explain why  $\pi_0 = 1$  and why  $\pi_N = 1$ .

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- Write out and explain the derivation of the homogeneous difference equation that can be used to find all the  $\pi_k$  values that have  $0 < k < N$ .
- Explain what the symbol  $d_k$  is used to represent in the video and then explain why  $d_0 = 0$  and why  $d_N = 0$ .
- Write out and explain the derivation of the inhomogeneous difference equation that can be used to find all the  $d_k$  values that have  $0 < k < N$ .