LONG TERM STATE and SYSTEMS

Two competing radio stations, station A and station B, each have 50 % of the listener market at some point in time. Over each one-year period, station A manages to take away 15 % of station B's share, and station B manages to take away 10 % of station A's share.

    a. Write down a transition matrix that describes the exchange of market shares between the two stations over each one-year period.   [1]

    b. Find the market share held by each station after one year.   [2]

    c. Write down the market shares of stations A and B over a five-year period.   [2]

    d. Find the market share held by each station in the long term if the same trend of market share exchanges between the two stations continues indefinitely.   [3]