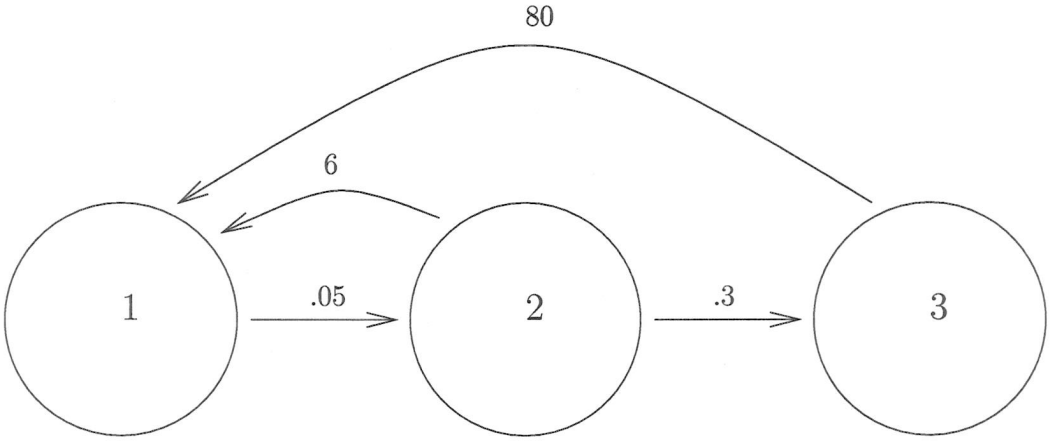
Mathematics 172

Quiz #15 Name: Key

You must show your work to get full credit.



For the loop diagram above

(1) What is the Leslie matrix? $A = \begin{bmatrix} 0 & 6 & 80 \\ .05 & 0 & 0 \\ 0 & .3 & 0 \end{bmatrix}$

(2) Find the stable age distribution and explain how you found it.

Proportion of 1 year olds. .9483

Proportion of 2 year olds. .0410

Proportion of 3 year olds. .0102

I choose an intial age distribution $\vec{n}(0) = \begin{bmatrix} 100 \\ 10 \\ 1 \end{bmatrix}$ computed $\vec{n}(50) = A^{50}\vec{n}(0) = \begin{bmatrix} 20748.0 \\ 8971.3 \\ 2230.6 \end{bmatrix}$

Total number $= 20748.0 + 8971.3 + 2230.6 = 218780$

Proportion of 1 year olds $= \frac{20748.0}{218780} = .9483$

Proportion of 2 year olds $= \frac{8971.3}{218780} = .0410$

Proportion of 3 year olds $= \frac{2230.6}{218780} = .0102$