Mathematics 172

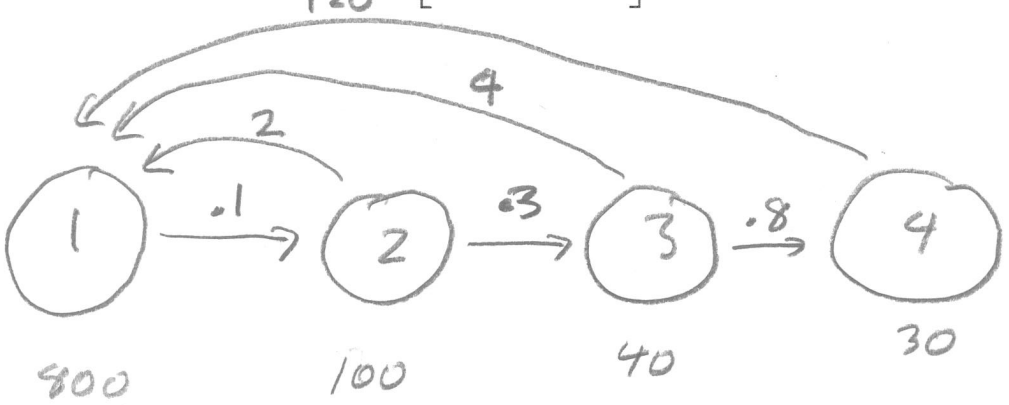
Quiz 27 Name: Key

You must show your work to get full credit.

A population of cicada like insects with a 4 year life cycle lives in a large park. The Leslie matrix for the life cycle of this population is

$$L = \begin{bmatrix} 0 & 2 & 4 & 120 \\ .1 & 0 & 0 & 0 \\ 0 & .3 & 0 & 0 \\ 0 & 0 & .8 & 0 \end{bmatrix}$$

1. Draw the loop diagram.



2. What does the number 4 mean in this context? That on the average 4 offspring to a stage 3 individual survive to be stage 1 the next year

3. What does the number .8 represent in this context? That .8 (ie 80%) of the stage 3 individual live to be stage 4 the next year.

4. This year there are 800 in stage 1, 100 in stage 2, 40 in stage 3, and 30 in stage 4 then how many are here in each stage next year? (You do not need to use matrices to do this problem.)

$2(100) + 4(40) + 30(120) = 3960$

$.1(800) = 80$

$.3(100) = 30$

$.8(40) = 32$

Number in stage 1 3960

Number in stage 2 80

Number in stage 3 30

Number in stage 4 32