Mathematics 172

Name:_____ Key_____
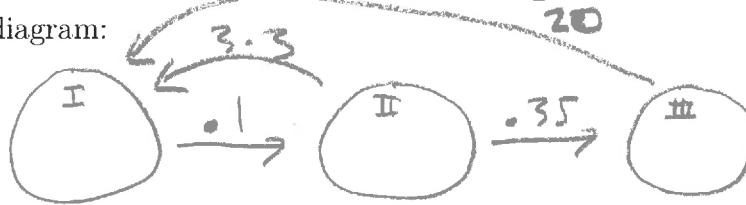
You must show your work to get full credit.

Some types of foxglove are biennial. A population of foxglove growing in a graveyard has its life cycle summarized by the Leslie matrix

$$L = \begin{bmatrix} 0 & 3.3 & 20 \\ 0.1 & 0 & 0 \\ 0 & 0.35 & 0 \end{bmatrix}$$

1. Draw the loop diagram:

2. (a) What does the number .35 represent?

The proportion of stage II that survive to stage III

(b) What does the number 3.3 represent?

The average number of seedlings produced by an individual stage II organism

This year there are 93 seedlings, 11 juveniles, and 3 adult foxgloves.

3. How many in each age group next year?

Number seedlings: 96.3   Number juveniles: 9.3   Number adults: 3.85

4. (a) How many in each age group after 20 years?

Number seedlings: 122.53   Number juveniles: 12.17   Number adults: 4.20

(b) What is the proportion in each age group after 20 years? Total N(20) = 138.90

Proportion seedlings: .882   Proportion juveniles: .088   Proportion adults: .030

5. (a) How many in each age group after 30 years?

Number seedlings: 137.12   Number juveniles: 13.55   Number adults: 4.69

(b) What is the proportion in each age group after 30 years? Total = 155.37

Proportion seedlings: .882   Proportion juveniles: .087   Proportion adults: .030