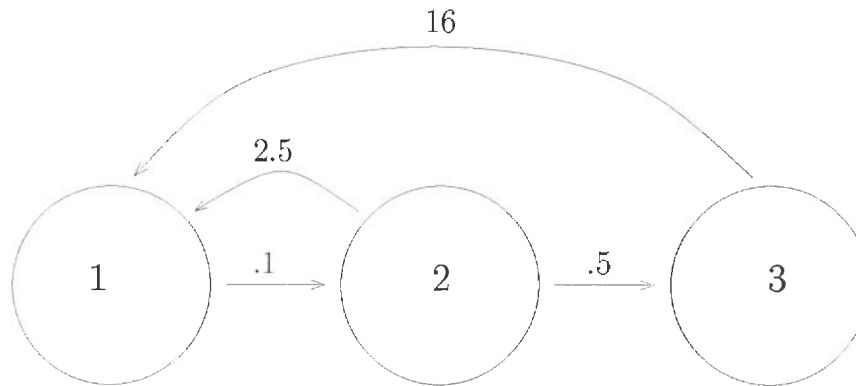**Quiz 22**   Name:_____Key_____

You must show your work to get full credit.

A type of frog has three stages. Sage one is tadpole. Stage two is juvenile. Stage three is adult. A population of these frogs is living in the pond on campus at the intersection of Pickens and Blossom. The life history of this population is summarized in the following loop diagram.

1. What is the Leslie matrix?

$$L = \begin{bmatrix} 0 & 2.5 & 16 \\ .1 & 0 & 0 \\ 0 & .5 & 0 \end{bmatrix} = A \text{ (in calculator)}$$

2. Assume that this year there are 200 tadpoles, 20 juveniles, and 11 adults.

(a) How many in each stage next year?

$$\vec{n}(0) = \begin{bmatrix} 200 \\ 20 \\ 11 \end{bmatrix} = B \text{ (in calculator)}$$

$$\vec{n}(1) = [A] * [B] = \begin{bmatrix} 226 \\ 20 \\ 10 \end{bmatrix}$$

Number of tadpoles _____226_____

Number of juveniles _____20_____

Number of adults _____10_____

(b) How many in each stage twenty years from now?

$$\vec{n}(20) = L^{20} \vec{n}(0)$$

$$= [A]^{\wedge}20 * [B]$$

$$= \begin{bmatrix} 296.47 \\ 29.24 \\ 14.43 \end{bmatrix}$$

Number of tadpoles _____296.47_____

Number of juveniles _____29.24_____

Number of adults _____14.43_____