## Quiz 20

For the Leslie matrix

$$A = \begin{bmatrix} 0 & 5 & 25 \\ .1 & 0 & 0 \\ 0 & .04 & 0 \end{bmatrix} = \begin{bmatrix} F_1 & F_2 & F_3 \\ P_1 & 0 & 0 \\ 0 & P_2 & 0 \end{bmatrix}$$

(a) Give the Euler-Lokta equation.

This is $\frac{F_1}{\lambda} + \frac{P_1 F_2}{\lambda^2} + \frac{P_1 P_2 F_3}{\lambda^3} = 1$

which in our case becomes

$$\frac{.5}{\lambda^2} + \frac{.1}{\lambda^3} = 1$$

(b) solve for $\lambda$. Using the calculator this is

$$\lambda = .7914$$

(c) Give the vector for the stable age distribution (without changing to percents)

This is $\begin{bmatrix} 1 \\ P_1/\lambda \\ P_1 P_2/\lambda^2 \end{bmatrix} = \begin{bmatrix} 1 \\ .1264 \\ .006 \end{bmatrix}$