

Quiz 31

For the predator-prey system

$$\frac{dV}{dt} = .1V - .001VP$$

$$\frac{dP}{dt} = -.2P + .005VP$$

This will be when $\frac{dV}{dt} = \frac{dP}{dt} = 0$, $V, P > 0$

$$\frac{dV}{dt} = V(.1 - .001P) = 0$$

$$\text{so } .1 - .001P = 0$$

$$\text{i.e. } P = \frac{.1}{.001} = 100$$

$$\frac{dP}{dt} = P(-.2 + .005V) = 0$$

$$\text{so } -.2 + .005V = 0$$

$$V = \frac{.2}{.005} = \underline{40}$$

so

$$\left. \begin{array}{l} V_{\text{average}} = 40 \\ P_{\text{average}} = 100 \end{array} \right\}$$