

10-28-05

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Reading Q	due	10-30-05
Ch 7 HW	due	11-4-05

7 p 165

$$\frac{\Delta m}{\Delta t} = 0.25m - .0005m^2 - .0025mn$$

$$\frac{\Delta n}{\Delta t} = 0.001mn - .4n$$

If $n=0$ we see m is logistic:

$$\frac{\Delta m}{\Delta t} = *m - *m^2$$

Type of model - look at interaction terms (mixed)

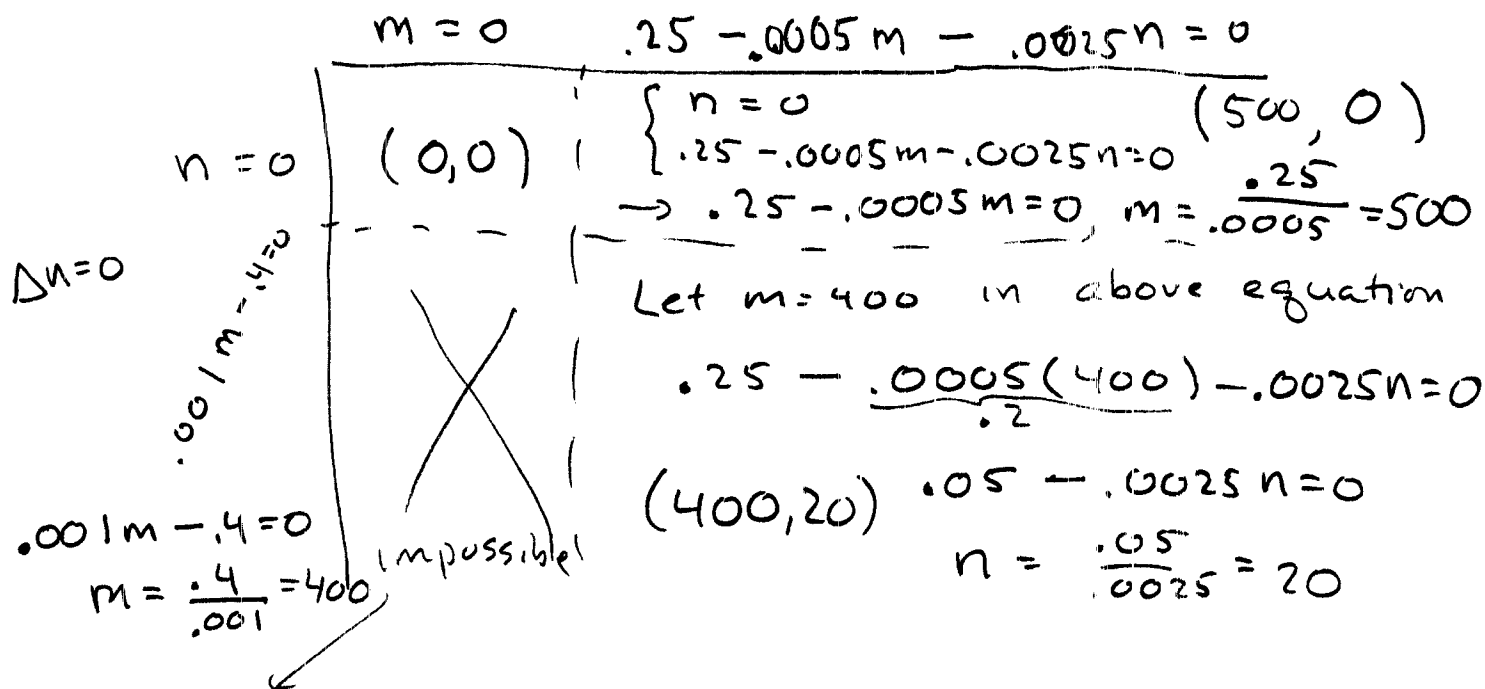
$$\frac{\Delta m}{\Delta t} = \dots - **mn \text{ (Prey)}$$

$$\frac{\Delta n}{\Delta t} = \dots + **mn \text{ (predator)}$$

Find Equilibrium Points: $\Delta M = 0 = \Delta n$ (2)

- * Factor $\Delta M, \Delta n$ 2-way
- * Compare factors in a table

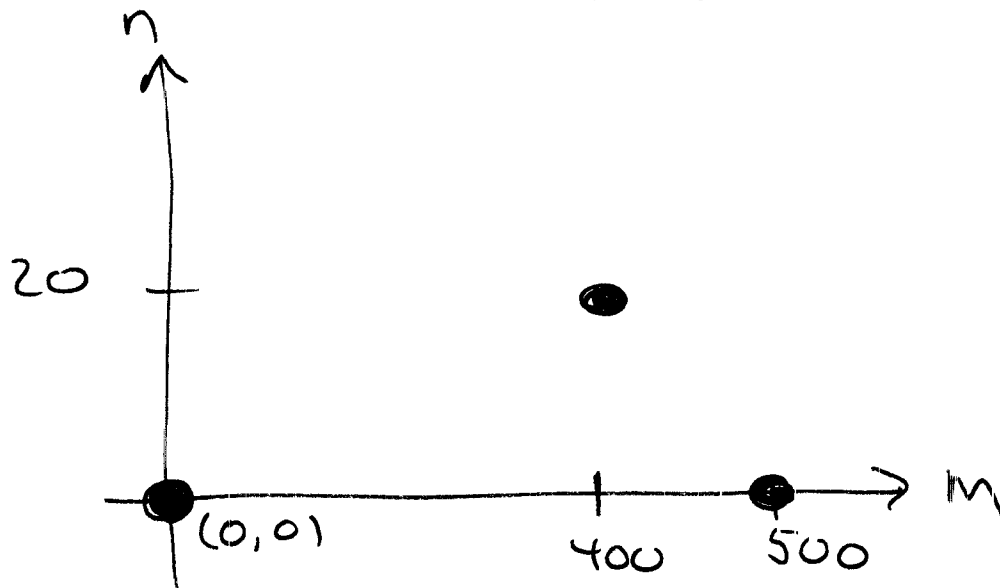
$$\Delta M = 0$$



be cause $\Delta M = 0$ requires $m = 0$

$$\Delta n = 0 \quad \text{---} \quad .001m - .4 = 0$$

$$\text{So } .4 = 0$$



Find Regions of Consistent Change.

(3)

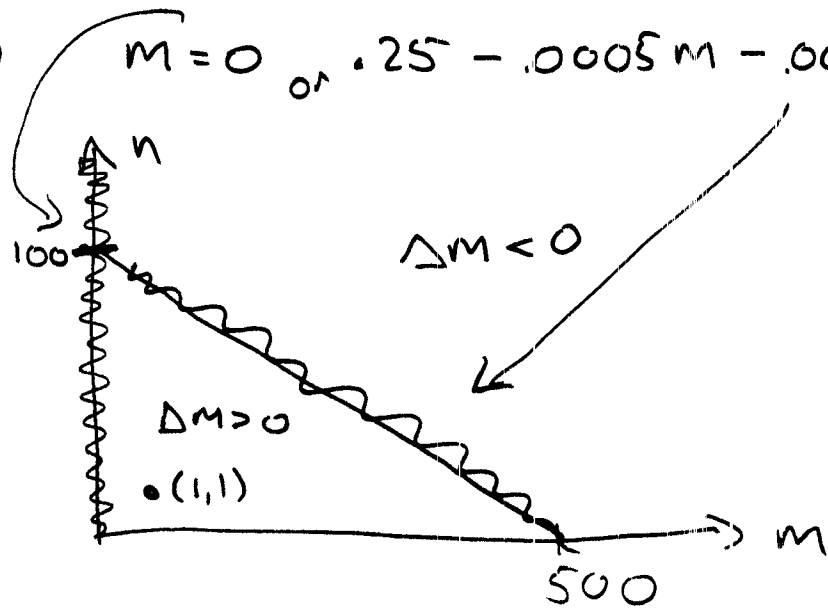
$\Delta M = 0$

$M = 0$ or $.25 - .0005M - .0025N = 0$

m	n
0	$\frac{.25}{.0025} = 100$
$500 = \frac{.25}{.0005}$	0

$500 = \frac{.25}{.0005}$

Plot 2 points to find line

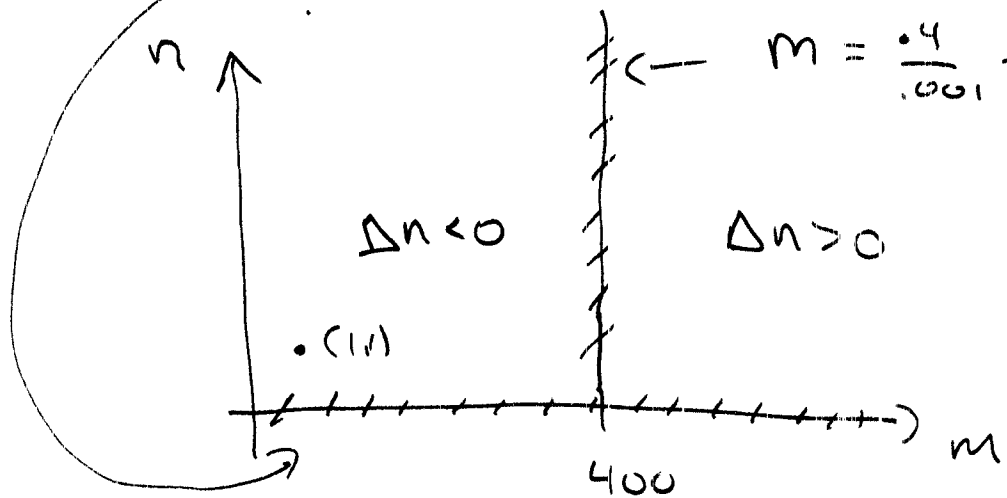


At Point (1,1)

$\Delta M = .25 - .0005 - .0025 > 0$

$\Delta n = 0$

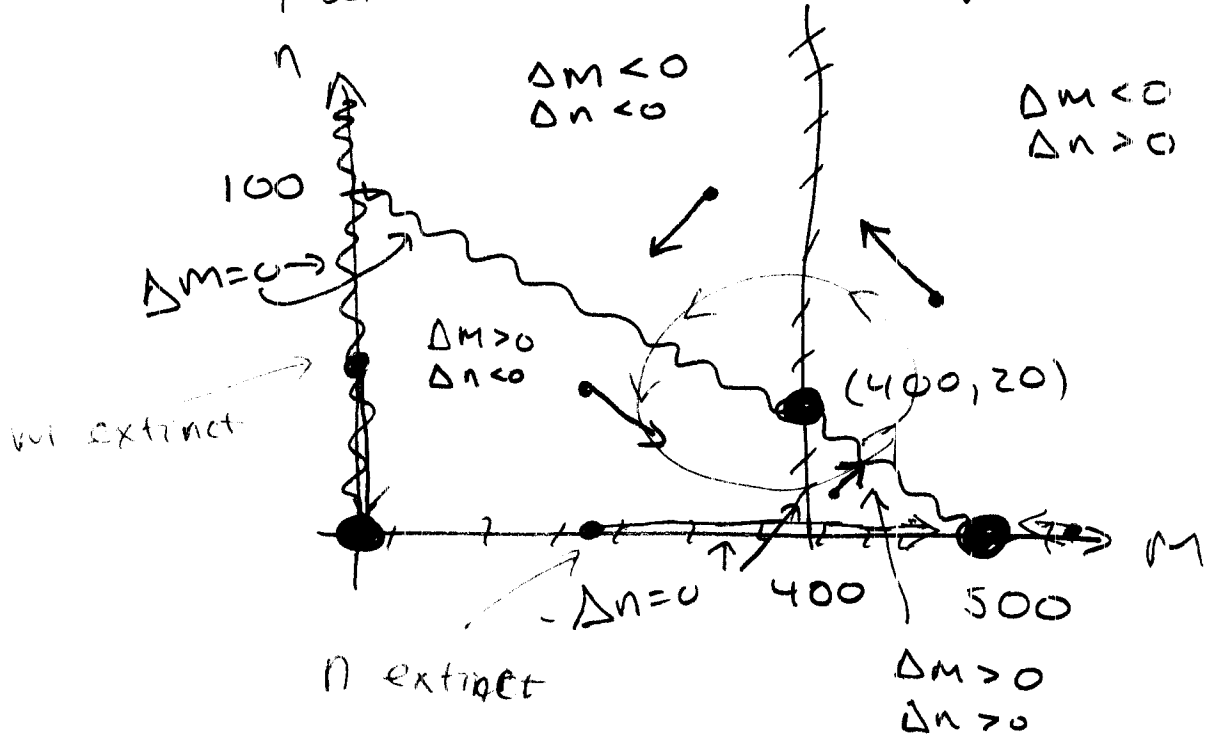
$n = 0$ or $.001m - .4 = 0$



at Point (1,1) = (m,n)

$\Delta n = .001 - .4 < 0$

Put Phase Plane together



Most likely biological event,
 Pop's m, n alternately
 increase & decrease as
 seen in the spiral in the phase plane.

- If m becomes extinct, n will also become extinct.
- If n becomes extinct, m will increase towards its logistic carrying capacity.