Name: _____ANSWERS_____

<u>Instructions:</u> Write your answers in the space provided. **Do not show calculations on this page.**

$$\frac{dN_1}{dt} = 0.12N_1\left(1 - \frac{N_1}{100} - \frac{N_2}{50}\right)$$

1. Consider the system of ODEs:

$$\frac{dN_2}{dt} = 0.53N_2\left(1 - \frac{N_2}{150} - \frac{N_1}{50}\right)$$

(a) State the steady states: __(0,0), (0,150), (40,30), (100,0)__ (coordinates!)

(b) Is the system competitive (Yes or No)? ___Yes___
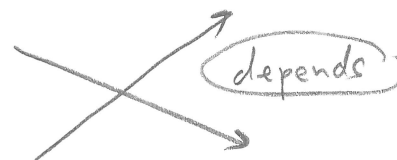
(c) Justify your response to (b) by any method.

Competition table:

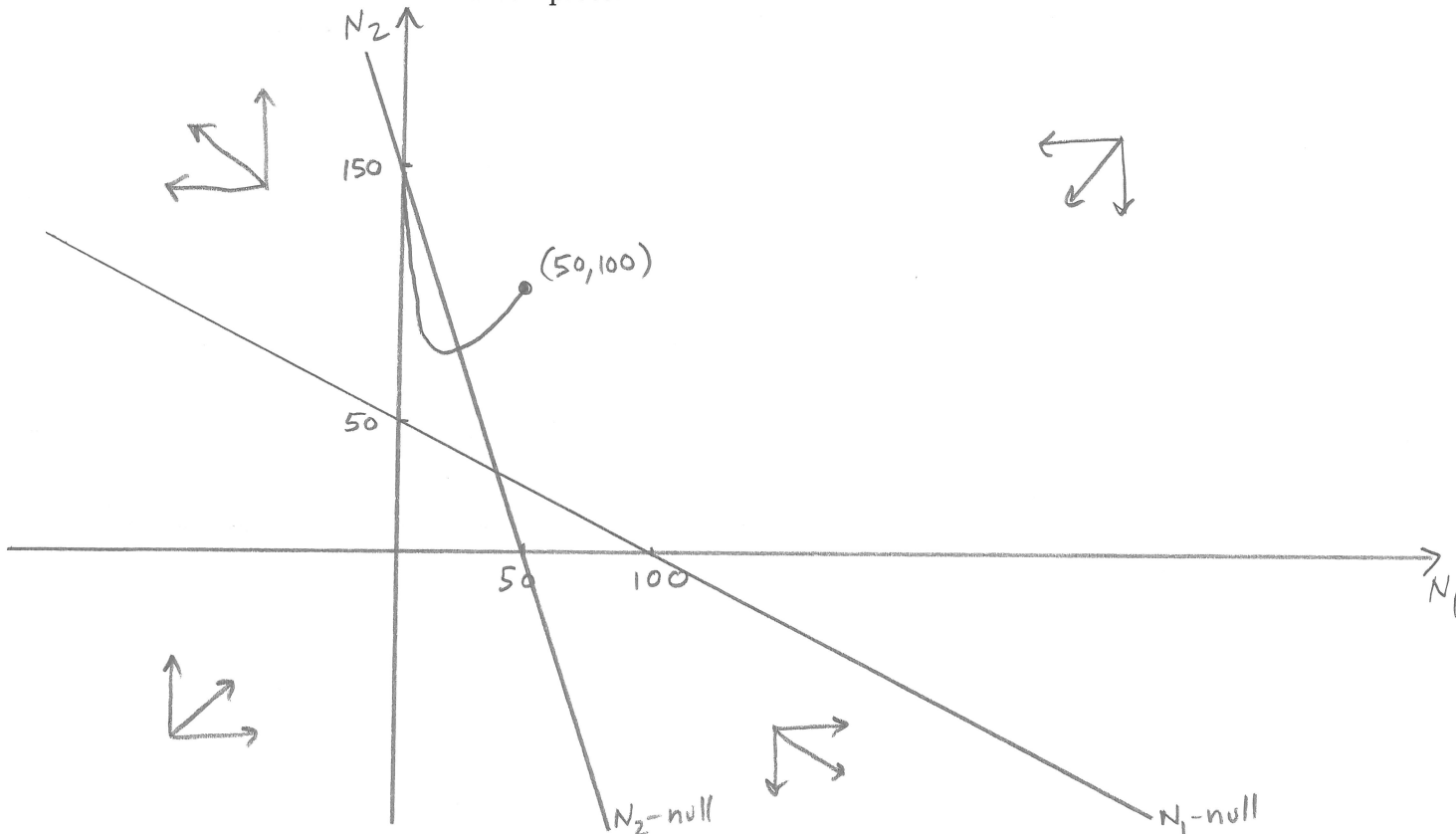|	1	2
1	0.01	0.02
2	0.02	0.007
Tot.	0.03	0.027

→ Competitive

OR

Lo's method

depends

(d) Plot the phase plot for the solution curve with initial value $(N_1, N_2) = (\overline{100}, \overline{50})$ [50, 100]. Your answer must include the graphs of nullclines, stability arrows, and the phase plot on fully labeled axes to be considered complete.

Bonus: Consider the data set: 13,3,2,15,13,10,7,13,6,3. What are the:

mean = __8.5__   mode = __13__   median = __8.5__ q_1 = __3__ q_3 = __13__