Mathematics 172

Quiz 28 Name: Key

You must show your work to get full credit.

Consider the following SIR model for the spread of a mild form of avian flu in a chicken farm with 1,000 chickens:

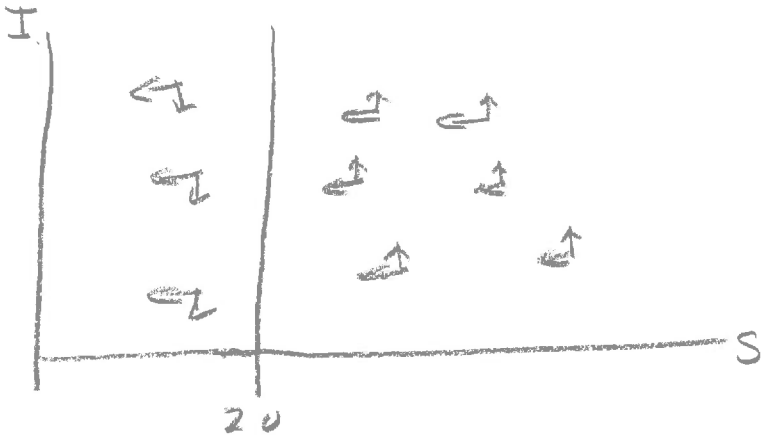
$$S' = -.01SI$$
$$I' = .01SI - .2I = I(.01S - .2)$$
$$R' = .2I$$

→ changing signs when $.01S - .2 = 0$ i.e. when $S = \frac{.2}{.01} = 20$

1. What is the average length of a case of the flu? Length is 5 days

It is the reciprocal of the recovery rate $= \frac{1}{.2} = 5$

2. Draw the S-I phase space with S along the x-axis and I-along the y-axis and showing the vertical where $I' = 0$. Also put in arrows showing the direction of motion.



3. What is the contact number, c, for the flu in this population? $c = \frac{.2}{.01} = 20$