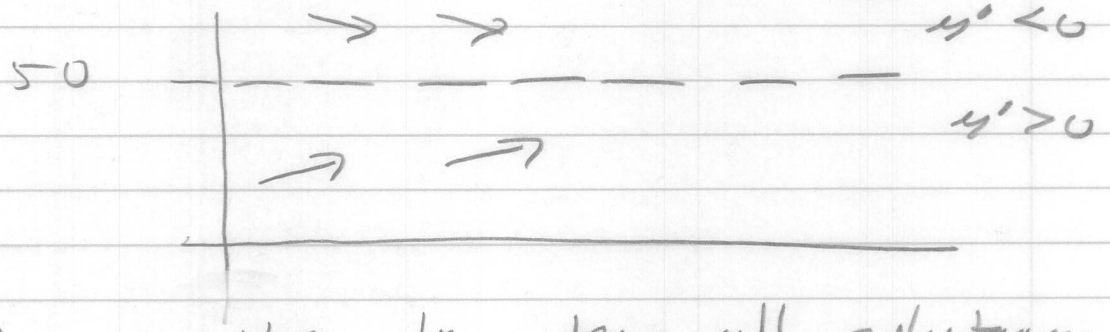
Quiz 30

a) For the rate equation

$$y' = 10 - .2y$$

describe the long term behavior.

$y' = 10 - .2y = 0$ when $y = \frac{10}{.2} = 50$



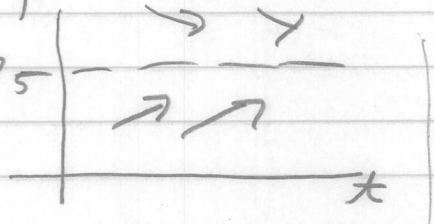
so in the long term all solutions go to $\boxed{y = 50}$

b) Use $\frac{df}{dt} = p_i(1-f) - p_e f$

to find the long term behavior when $p_i = .7$, $p_e = .9$

$$\frac{df}{dt} = .7(1-f) - .9f = .7 - 1.6f$$

thus $\frac{df}{dt} = 0$ when $f = \frac{.7}{1.6} = .4375$



so in the long term .4375 (i.e. 43.75%) of the regions are populated.