Mathematics 172

Quiz 15 Name: Key

***You must show your work to get full credit.***

Let $A(t)$ be the number of pounds of duckweed in a pound $t$ weeks after it is first introduced into the pound. Assume that $A$ satisfies the rate equation

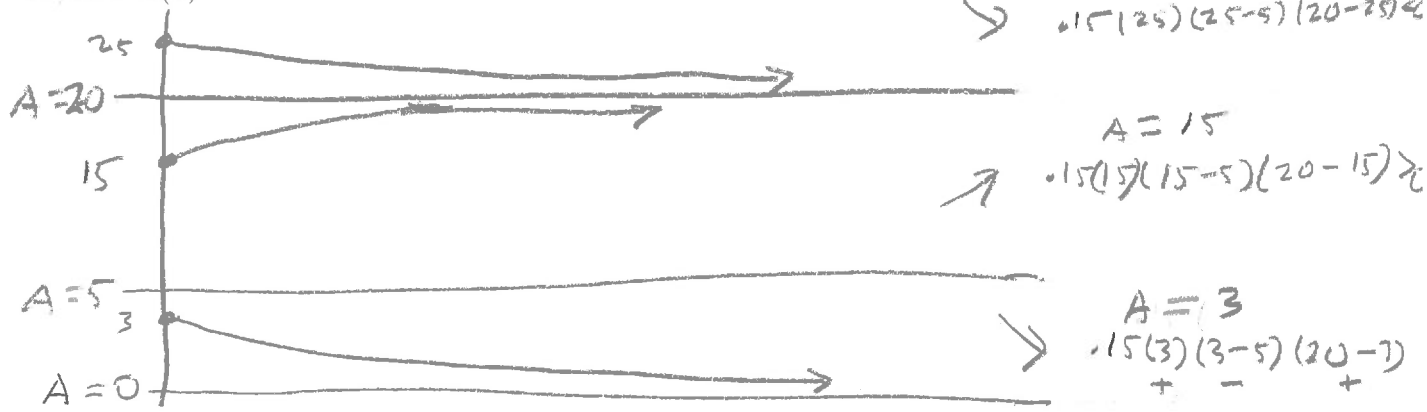
$$\frac{dA}{dt} = .15A(A-5)(20-A).$$

(a) What are the equilibrium points of the rate equation?

Set $.15A(A-5)(20-A)=0$ The equilibrium points are $0, 5, 20$

This sims $A = 0, 5, 20$

(b) Sketch a graph showing the equilibrium solutions along with the three solutions with $A(0) = 3$, $A(0) = 15$, and $A(0) = 25$.




(c) Use your graph to determine which of the equilibrium are stable and which are unstable.

The stable equilibrium point(s) are: $0, 20$

The unstable equilibrium point(s) are: $5$

(d) For the solution with $A(0) = 3$ estimate $A(100)$. $A(100) \approx$ $0$

(e) For the solution with $A(0) = 25$ estimate $A(79)$. $A(79) \approx$ $20$