Mathematics 172

Quiz 4 Name: Key

You must show your work to get full credit.

Consider the rate equation

$$\frac{dN}{dt} = -.05N(N-5)(N-15)$$

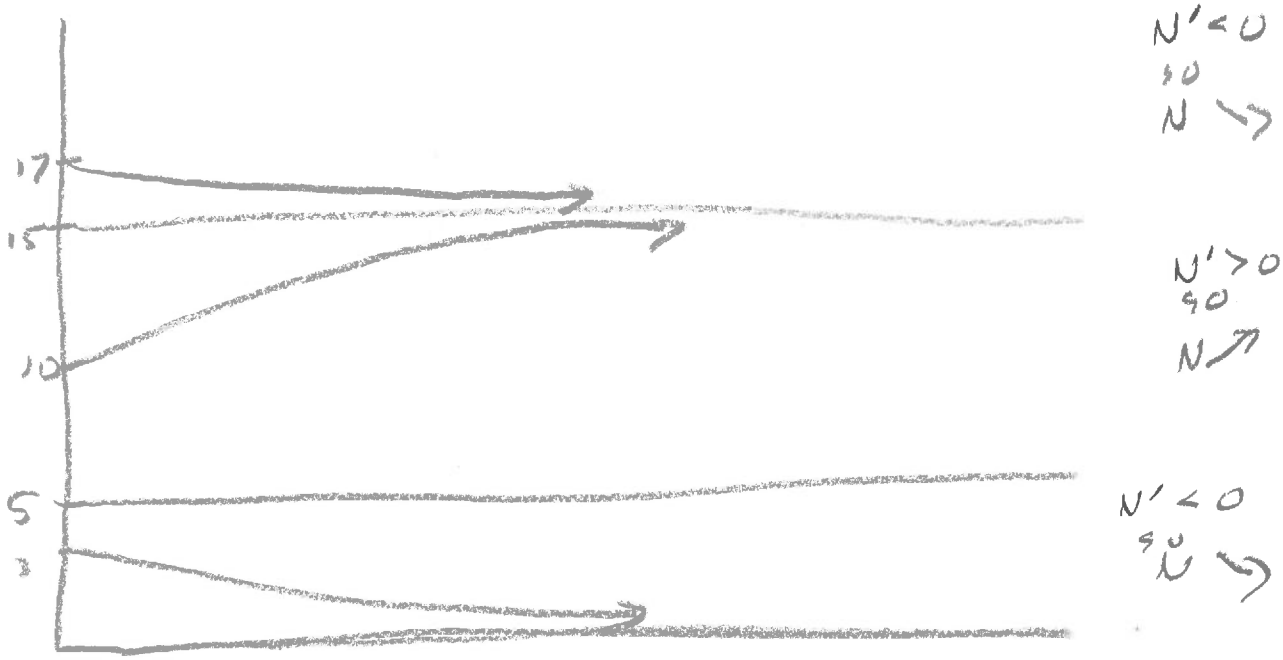
1. If $N(3) = 12$, what is $N'(3)$? $N'(3) =$ 12.6

$N'(3) = -.05N(3)(N(3)-5)(N(3)-15)$
$= -.05(12)(12-5)(12-15)$
$= 12.6$

2. What are the rest points of the equation? Rest points are: 0, 5, 15

solve $-.05N(N-5)(N-15)$ to get $N = 0, 5, 15$

3. Make a picture showing the rest solutions, the solution with $N(0) = 3$, the solution with $N(0) = 10$ and the solution with $N(0) = 17$.



4. If $N(0) = 3$ estimate $N(100)$. $N(100) \approx$ 0

This solution decreases to 0

5. If $N(0) = 10$ estimate $N(143)$. $N(143) \approx$ 15

This solution increases to 15