Math 140 Notes 11.25.14

A few words about the logistic growth model on pp. 358-60 in section 6.4.

The solution of the logistic growth ODE gets down to the following:

$$\int \frac{M}{P(M-P)} dP = \int k dt$$

Here is a quick way to split the integrand into fractions. Assume one can write:



Then, find the A and B that will work - by the following trick: Plug in two different values

of the variable P and it will force the conditions on A and B.

In other words, let P = 1 and we get $\frac{M}{M-1} = A + \frac{B}{M-1} \quad \text{or} \quad M = A(M-1) + B$

and then let P = 2 and we get $\frac{M}{2(M-2)} = \frac{A}{2} + \frac{B}{M-2} \text{ or } M = A(M-2) + 2B$

So, now we solve for B in one equation and plug it into the other, getting A = 1 and B = 1as shown in the text.

d.t.