Biology 301 Homework

Assignment 2: Read Chapter 3 of Otto and Day. This homework reviews useful techniques from algebra and calculus (see Appendices 1 and 2 of the book for a refresher). To be completed within your study group and jointly handed in (one per group). **Due Thursday September 19.**

Math Review Problems

(1) Solve $\log_{10}(z^t) = y$ for t.

(2) Solve $\ln(z^t) = y$ for t.

(3) Solve $z^t = y$ for t.

(4) Factor and solve $x^2 - 3x + 2 = 0$ for x

(5) Simplify and then solve $5 \ln(a x) - 2 \ln(b x^3) + \ln(c x^2) = d$ for x

(6) Factor and then $4 x^3 + 4 y x^2 = x + y$ for x

(7) Factor $\frac{x^2-9}{2x-6}$

(8) Factor $2 + \frac{x}{5-x}$

(9) Find the derivative with respect to x of the following functions:

$a x^3$, $\frac{7x^2}{5x+1}$, e^{2x+7}, $x^n e^{ax}$, $\ln(ax^2 - c)$, $\ln(2 x^5)$, $\cos(a x)$, $\sin^2(5 x)$

(10) Integrate the following with respect to x:

$\int_0^5 2x \, dx$, $\int \sin(x) + 6 x^2 \, dx$, $\int \frac{\tan(3)}{x} \, dx$, $\int_0^\infty e^{-5x} \, dx$

(11) Show how you can use integration by parts to integrate $\int \ln(x) \, dx$