Bio 301 Homework

Assignment 2: Read Chapter 3 of Otto and Day. This homework focuses on reviewing some basics from algebra and calculus (due Thursday September 21).

Math Review Problems

Consult Appendices 1 and 2 in the textbook if needed.

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 $x^2 - 9x + 18 = 0$ for $x$.

5. Solve $3 \ln(a \cdot x) - \ln(b \cdot x^3) + \ln(c \cdot x) = d$ for $x$.

6. Solve $5x^3 + 5y^2 = x + y$ for $x$.

7. Factor $\frac{x^2 - 4}{4x + 8}$.

8. Factor $1 + \frac{7x}{x - 3}$.

9. Find the derivative with respect to $x$ of the following functions:

- $a \cdot x^3$
- $\frac{4x}{x^3 + 1}$
- $e^{3x + 7}$
- $x^n \cdot e^{a \cdot x}$
- $\ln(ax^2 - c)$
- $\ln(4 \cdot x^2)$
- $\cos(a \cdot x)$
- $\sin^2(5 \cdot x)$

10. Integrate the following with respect to $x$:

- $\int_0^1 3x \, dx$
- $\int \cos(x) + 6x^5 \, dx$
- $\int \frac{\sin(2)}{x} \, dx$
- $\int_0^\infty e^{-2x} \, dx$

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