

LB 118, Section 003, Spring 2016
Homework 8 (due 03/30)

Instructions: Please review the section of the course syllabus on homework before writing up your solutions to the problems below. Do not write on or turn in this document. Instead, write your solutions on looseleaf or blank paper. Homework is due at the start of class.

Please read through sections 5.3, 5.4, 5.5 (this a challenging section; skip Example 5.5.7 since there errors in the exposition, and skip pp. 204–209), and 5.6 of the textbook and carefully work through the Explore exercises before attempting the problems below. You should also read through Chapter 6. Use Khan Academy to practice the techniques introduced in Chapter 6.

1. Solve Exercise 5.4.9.
2. Solve Exercises 5.5.1 (d) and 5.5.2 (d).
3. Solve Exercise 5.5.9 (a) and (b). You are asked to plot semilog graphs. This means that one axis will have a logarithmic scale and the other will have (as we usually use) a linear scale. To do this, plot $\ln P(t)$ versus t . Please use RStudio to generate the graphs. Don't forget to do the second part of the problem!
4. Solve Exercise 5.6.9 (e). First, solve it as stated by using logarithmic differentiation. This means you take the following steps:
 - take the logarithm of both sides of the equation
 - use properties of logarithms to expand the expression so that the terms are easier to differentiate
 - take the derivative of both sides of the equation; this is implicit differentiation, so be careful when differentiating terms which contain the dependent variable
 - solve for the derivative of the dependent variable

And then, second, compute the derivative using the quotient rule. Verify that you obtain the same answer using both methods.

Self-study Problems. The following exercises are for self-study. Please do not turn in solutions to these exercises. On the other hand, please do ask how to solve these problems on our Piazza discussion forum if you find some which you are not certain how to solve or one for which you are not certain you've found the correct answer.

Chapter 5 Exercises: 5.1.1, 5.1.3–6, 5.2.1, 5.2.3, 5.2.8, 5.2.9, 5.3.1, 5.3.3–5, 5.4.2, 5.4.4–5, 5.5.1–3, 5.5.5, 5.5.9–11, 5.5.15, 5.6.1–2, 5.6.5, 5.6.8–9.

Chapter 6 Exercises: 6.1.1–2, 6.1.8, 6.1.10–12, 6.1.18, 6.2.1–3, 6.2.5, 6.3.1–3.