

Week 2

Deliverables

- Report 1: Assignments 5–8.

Per capita growth rate and its associated differential equation

Assignment 5 requires you to solve the autonomous differential equation which relates the per capita growth rate of a population to its development over time. To learn more about this type of differential equation, do the following exercises:

- **C:** Problems 59–60 of Section 4.6.1. (*Hint:* Closely related to Example 6 of Section 4.6 in **C**.)
- **C:** Problem 17 of Section 8.1.4. (*Hint:* Closely related to Example 3 of Section 8.1.2 in **C**.)

Now, solve Assignment 5.

Linear Equations

Assignment 6 and one part of Assignment 7 are based on the assumption that you know about linear relationships and proportionality. If you do not recall these concepts, do the following exercises:

- **C:** Problems 7–8 of Section 1.1.7. (*Hint:* See Section 1.1.2 in **C**.)
- **C:** Problems 45–46 of Section 1.1.7. (*Hint:* Closely related to Example 5 of Section 1.1.2 in **C**.)

Solve Assignment 6.

Exponential decay

Assignment 7, the other part, is about exponential decay. To learn about the model for exponential decay, do the following exercises:

- **C:** Problems 61 and 64 of Section 1.2.9.
- **C:** Problem 2 of Section 1.5.

Hint: These problems are closely related to Examples 10 and 11 of Section 1.2.5 in **C**.

Now, solve Assignment 7.

MATLAB practice

Assignment 8 again requires some MATLAB programming skills. Albeit no more than what you needed for Assignment 4. If you would, nevertheless, like to refresh your memory, work on the following exercises:

- **P:** Exercises 1(a–d) and 2 of Section 5.5.

Hint: Take particular notice of Sections C–C.2 in **P**.

Solve Assignment 8.

Curriculum

- C** Sections 4.1, 4.6, 8.1–8.1.2. *Derivatives and Solving Differential Equations.*
- LA** Sections 1.2–1.3. *Basic Vector and Matrix Arithmetics.*
- P** Chapters 4–5 and Sections C–C.2. *Data Types and Array Expressions.*

Although Appendix C of **P** is not mentioned on the weekly schedule of the course overview until Week 4, we recommend that you read it bit by bit in Weeks 2 and 3 and then again in Week 4 because it is essential to the contents of this course.