

Introduction to Differential Equations

Tentative Due Dates Spring 2018

2280-2 12:55 PM in LCB 219

Questions: 801-581-6879, Office: 113 JWB. Email ggustaf@math.utah.edu

HW 1, Due Week 2

1.1: 1, 4, 5, 6, 9, 15, 19, 27, 29, 30, 32, 33, 34

Reading. Required background. Nothing graded from 1.1.

1.2: 1, **2**, **4**, 5, **6**, 7, 9, **10**, 13, 15, 16, 18,
21, 22, 24, 26, 29, 31, 32, 33, 35, 40, 41

1.3: 2, 3, 5, 6, **8**, 10, 11, 13, **14**, 23, 25, 26, 33

1.4: 2, 3, 4, **6**, 9, **12**, 13, **18**, 19, 20, 21, **22**, **26**, 36,
41, 42, 45, 46, 49, 51, 56, 59

Print Exercise 1.3-8 image at 200% from here:

<http://www.math.utah.edu/~gustafso/s2018/2280/images/exercise1.3-8-EdwardsPenney.jpg>

HW 2, Due Week 3

1.5: 1, 7, **8**, **10**, 13, **18**, **20**, 21, 23, 24, 33,
34, 36, 39

3.7: 1, 2, **4**, 7 [LC and RC circuits, LRC after 3.6]

2.1: 1, 3, 4, 6, **8**, 10, 12, **16**, 22, 23, 33, 37

2.2: 5, 7, 8, 9, **10**, 11, 15, 17, **18**

2.3: 2, 3, 9, **10**, 13, 14, 17, 18, 19, **20**, **22**, 24, 25

HW 3, Due Week 4

No exercises due, only the computer Numerical DE Project (below),
which uses the statements from exercises 2.4-6, 2.5-6, 2.6-6.

2.4: 2, 3, 4, **6**, 10, 12, 17 Euler's method

2.5: 3, 4, 5, **6**, 10, 12 Improved Euler or Heun

2.6: 3, 4, 5, **6**, 10, 12 Runge-Kutta, RK4

The source and instructions for this project can be found here:

<http://www.math.utah.edu/~gustafso/s2018/2280/homework/numericalDEproject/numericalDEproject-S2018.pdf>

The due date for this numerical project is Week 7. Submit it with maple lab 1.

HW 4, Due Week 5

3.1: 1, 6, 10, 27, 33, **34**, **36**, 37, **38**, 39, **40**, 41, **42**, 43, **46**, **48**, 53

3.2: 1, 2, 5, 8, 11, 13, 16, **18**, 19, 20, 21, **22**, 23, 25, 26

3.3: 3, 7, **8**, 9, **10**, 11, **16**, 17, 23, 27, 31, **32**, 37, 40

3.4: 3, 4, 5, 6, 10, 11, 15, 17, 19, **20**, 21, 33, **34**

Computer Lab 1, Due Week 5:

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab1/2280mapleL1-intro-S2018.pdf>

HW 5, Due Week 6

3.5: 2, 3, 5, **6**, 10, 11, **12**, 19, 21, **22**, 25, 27, 29, 31, 34, 39,
43, 45, 47, 51, 52, **54**, 57, **58**, 59

3.6: 3, **4**, 5, 7, **8**, 9, **11**, 13, 15, 17, **18**, 20, 21, 22

3.7: 1, 2, 4, 7, **12**, 15, **18**, 19 [LRC circuits]

HW 6, Due Week 7

7.1: 1, 3, 7, 9, 11, 13, 17, **18**, 19, **22**, 23, 27, **28**, 29, 31, 40

7.2: 3, 7, 9, **10**, 15, **16**, 17, 19, **20**, 21, 23, **24**, 35, 37

7.3: 3, **6**, 7, 9, **12**, 13, 17, **18**, 20, 23, 27, 28, 29, 30, 32, 34, 37

Computer Lab 2, Newton Cooling, Due Week 7. Choose one project.

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab2/2280mapleL2-freezing-pipes-S2018.pdf>

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab2/2280mapleL2-swamp-cooler-S2018.pdf>

HW 7, Due Week 8

7.4: **2**, 3, 9, 13, 15, 17, **22**, 23, 26, 27, 29, 30, **36**, 37

7.5: 3, **4**, 7, 9, 11, 13, **14**, 21, **22**, 25, 27, **28**, 31, 33, 34, 37

Computer Lab 3, Laplace. Due Week 8.:

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab3/2280mapleL3-laplace-S2018.pdf>

HW 8, Due Week 9

7.6: 2, 5, 6, **7**, **8**, 11, **12**, 18, 21, **22** [impulses and Laplace]

4.1: 1, 3, 2, 5, 7, **8**, 11, 12, 15, 17, **20**, 21, 24, 26

4.2: 7, **12**, 27; A Laplace or Cayley-Hamilton-Ziebur solution is acceptable.

4.3: 7, **9**, 21;

RK4 for systems is found here:

<http://www.math.utah.edu/~gustafso/s2018/2280/lectureslides/numericalVectorMethods.pdf>

For Exercise 4.3-9 and similar computer problems, see all files numerical-4.3* in the directory <http://www.math.utah.edu/~gustafso/s2018/2280/maple/maple-examples/>

HW 9, Due Week 10 before Spring Break (Week 11, no classes)

5.1: **16**, 17, **20**, **22**, **24**, 25, **28**

HW 10, due Week 12, after Spring Break

Edition 4:

5.2: **8**, 11, 13, **20**, 21, 27, 29, **30**, 31, 35, 39, 43, 45, 49

5.3: **6**, 9, 13, 19, **24**, 27

5.4: 1, 7, **11**, **29**

5.5: 1, 3, **4**, 11, **12**, 23, **38**

Edition 5:

5.2: **8**, 11, 13, **20**, 21, 27, 29, **30**, 31, 35, 39, 43, 45, 49

5.4: **6**, 9, 13, 19, **24**, 27

5.5: 1, 7, **11**, **29**

5.6: 1, 3, **4**, 11, **12**, 23, **38**

Section 5.3 of 5/E is a reference for Chapter 6. No problems due.

Computer Lab 4, Resonance. Due Week 12.:

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab4/2280mapleL4-resonance-S2018.pdf>

HW 11 does not exist. Spring Break.

No Quiz 11. No Lab 11.

HW 12, due Week 13

5.6 [5.7 in edition 5/E]: 1, 13, **15**, 19, **23**

6.1: 3, **4**, 5, 7, **8**, 11, 15, 17, **18**

6.2: **2**, 5, 7, 9, **12**, 13, 17, 19, 21, **22**, 23, 29

6.3: 5, 7, **8**, **9**, **10**, 11, 18, 19

HW 13, due Week 14

6.4: 1, 3, **4**, **8**, 9, 10, 11, 13, 14

6.5: Not covered in class, nothing due.

Computer Lab 5, Brine Tank, Due Week 14:

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab5/2280mapleL5-brineTank-S2018.pdf>

HW 14, due Week 15

9.1: **6**, 7, **10**, **13**, 15, 17, 20, **24**, 30

9.2: 2, **8**, 9, **20**

9.3: 1, **4**, 9, **17**, **20**

9.4: **1**, 7, **9**, 13

HW 15, due by 6pm on May 7 under the door JWB 113

9.5: 1, 2, **3**, **7**, **9**

9.6: 1, **5**

Extra Credit Computer Labs 6 and 7, Due May 7:

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab6/2280mapleL6-narrows-S2018.pdf>

<http://www.math.utah.edu/~gustafso/s2018/2280/maple/lab7/2280mapleL7-earthquake-S2018.pdf>