

## Practice Problems for Math 331 – Professor Richard S. Ellis

**Text:** Erwin Kreyszig, *Advanced Engineering Mathematics*, Tenth Edition, Wiley, 2011.

### Comments

1. Do not pass in these problems unless they have been assigned as homework. The text has the answers to all odd-numbered problems.
2. The purpose of the practice problems is to help you understand the material. There is no need to do all of them. Do enough of them to convince yourself that you understand the material.
3. The problems for each section appear at the end of the section. The review exercises appear at the end of each chapter.

### Chapter 1. First-Order ODEs

§1.1 1–8, 9–13

§1.3 2–3, 5–6, 8–10, 11–12, 14–16

§1.4 1–6, 8–9, 12–15

§1.5 3–7, 9, 12, 22–25, 27–28

Review Exercises for Chapter 1: 1–2, 5–6, 17–21, 22, 24

### Chapter 2. Second-Order Linear ODEs

§2.1 3–5, 7–8 (hint for these 5 problems: let  $u(x) = y'(x)$ ; solve the first-order ODE for  $u(x)$ ; integrate to find  $y(x)$ ), 15–19

§2.2 1–2, 4–5, 11–14, 16–20, 21–29

§2.6 2–6, 9, 11, 13–14

§2.7 1–6, 11–14

Review Exercises for Chapter 2: 7–9, 19–21

### Chapter 4. Systems of ODEs. Phase Plane. Qualitative Methods.

§4.1 10–13

§4.3 1–8, 10–15

§4.4 1–10, 11–13 (no sketches or graphs for #12)

Review Exercises for Chapter 4: 11–17, 18–19

### Chapter 5. Laplace Transform

§6.1 1–6, 9–11, 26–32

§6.2 1–9

§6.3 2–5, 12–15 (no sketches or graphs)

§6.5 1–7, 8–11, 17–20

Review Exercises for Chapter 6: 12, 29