1. 18.11 (Solution by David Maxwell)

2. 18.17 (Solution by TJ Barry)

3. 18.21 (Solution by Slava Garayshin)

4. 18.26 (Solution by Will Mitchell)

5. 18.36 (Solution by Lyman Gilispie)

6. 18.39 (Solution by Slava Garayshin)

7. 18.40 (Solution by TJ Barry)

8. (Solution by Will Mitchell)
Suppose $f : [a,b] \to [-M, M]$. Show that f is measurable if and only if

$$\sup\left\{\int_a^b \phi : \phi \text{ is simple and } \phi \le f\right\} = \inf\left\{\int_a^b \psi : \psi \text{ is simple and } \psi \ge f\right\}.$$

Conclude that every Riemann integrable function is Lebesgue integrable and that its Riemann and Lebesgue integrals agree.

9. 18.47 (Solution by Lyman Gilispie)

10. 18.55 (Solution by David Maxwell)

11. (Solution by David Maxwell)
For $t \in \mathbb{R}$ and $f \in L_1$, let $f_t(x) = f(x-t)$. Show that $f_t \in L_1$ and that the map $t \mapsto f_t$ is continuous from $\mathbb{R}$ to L_1.