NINTH HOMEWORK, DUE WEDNESDAY NOVEMBER 10TH, BY 4:45PM

Feel free to work with others, but the final write-up should be entirely your own and based on your own understanding.

1. (10 pts) (5.2.13)
2. (10 pts) (5.2.14)
3. (10 pts) (5.3.4)
4. (10 pts) (5.3.13)
5. (10 pts) (5.4.13)
6. (10 pts) (5.4.14)
7. (10 pts) (5.4.21)
8. (10 pts) (5.5.3)
9. (10 pts) (5.5.4)
10. (10 pts) (5.5.9)
11. (10 pts) (5.5.11)
12. (10 pts) (5.5.12)

Just for fun: Find a bounded region $D \subset \mathbb{R}^2$ of type 3, so that

$$D = \{\, (x, y) \in \mathbb{R}^2 \mid a \leq x \leq b, \gamma(x) \leq y \leq \delta(x) \,\} = \{\, (x, y) \in \mathbb{R}^2 \mid c \leq y \leq d, \alpha(y) \leq x \leq \beta(y) \,\}$$

and a function $f \colon D \longrightarrow \mathbb{R}$ such that

$$\int_a^b \left(\int_{\gamma(x)}^{\delta(x)} f(x, y) \, \mathrm{d}y \right) \mathrm{d}x,$$

exists but

$$\int_c^d \left(\int_{\alpha(y)}^{\beta(y)} f(x, y) \, \mathrm{d}x \right) \mathrm{d}y,$$

does not.

Is the function f integrable over D?