

- Routine problems:

§5.7. # 19, 27, 36, 49.

§5.8. # 1-6, 14, 15, 21, 22, 32.

§5.9. # 13, 14, 21.

§6.1. # 35, 37.

§6.2. # 5, 13, 21, 27, 39, 45.

§6.3. # 5, 31, 34.

§6.5. # 7, 10.

- To hand in:

(1) Let  $F(x) = \int_{\cos(x^2)}^{\sqrt{x}} \frac{dt}{\sqrt{t^4 + 1}}$ . Compute  $F'(x)$ .

(2) Assume that  $f, g : [a, b] \rightarrow \mathbb{R}$  are continuous and that  $f', g' : [a, b] \rightarrow \mathbb{R}$  are also continuous. Show that

$$\int_a^b f'(x)g(x) dx = f(b)g(b) - f(a)g(a) - \int_a^b f(x)g'(x) dx$$

**Hint:** Compute  $\int_a^b (f(x)g(x))' dx$  in two ways.

(3) Suppose that  $f$  and  $g$  are continuous on the real line and have the same averages over every interval. Show that  $f = g$ .