

Homework #6

Routine problems:

5.2. # 5, 15, 18.

5.3. # 3, 5, 20, 22, 24, 33, 36.

5.4. # 9, 13, 17, 35, 36, 37, 46, 61.

5.5. # 11, 12, 13.

5.6. # 11, 15, 29, 48, 50.

To hand in:

- (1) Show that for all $x \in \mathbb{R}$,

$$\int_0^x (t + |t|)^2 dt = \frac{2}{3}x^2(x + |x|)$$

- (2) Let f be a function for which f' is continuous on a, b . Show that

$$\int_a^b f(t)f'(t) dt = \frac{1}{2} (f^2(b) - f^2(a)) .$$

- (3) Compute the area of the region bounded by the curves $y = x^2 + 1$, $y = x^2 + x$, and $y = 2$.