Math 361: Real Analysis 2 Assignment # 4

- 1. Suppose $f, g \in \mathcal{R}[a, b]$ show:
 - (a) if $k \in \mathbb{R}$ then $kf \in \mathcal{R}[a, b]$.
 - (b) if $f(x) \le g(x)$ for all $x \in [a, b]$ then $\int_a^b f \le \int_a^b g$.
- 2. Let f(x) = x and a < b. Show that $f \in \mathcal{R}[a, b]$ and find $\int_a^b f$.
- 3. Let g(x) = 4x + 3. Show $g \in \mathcal{R}[1, 4]$ and find $\int_1^4 g$.
- 4. Suppose $f \in \mathcal{R}[a, b]$ and $c \in \mathbb{R}$, we define $g : [a + c, b + c] \to \mathbb{R}$ by g(x) = f(x c). Prove that $g \in \mathcal{R}[a + c, b + c]$ and:

$$\int_{a+c}^{b+c} g = \int_{a}^{b} f$$

The function g is called to c-translate of f.