MATH 460 **Name:**

Homework 12, Fall 2023

Homework 12 has questions 1 through 1 with a total of 10 points. This work is due **Saturday 2 December** at 11:59 PM.

10 1. Let $a, b \in \mathbf{R}$ with $a < b$; and let $F \in [a,b] \to \mathbf{R}$ be bounded and increasing. Show that F is Riemann integrable on $[a,b]$.

Notice Since F is increasing, for every partition $a = x_0 < x_1 < x_2 < \cdots < x_n = b$ and for all $k \in 0 \ldots n-1$, we have

$$\inf(F([x_k, x_{k+1}])) = F(x_k),$$
$$\sup(F([x_k, x_{k+1}])) = F(x_{k+1}).$$

And further, for all $k \in 0 \ldots n-1$, we have $F(x_{k+1}) - F(x_k) \leq F(b) - F(a)$.