Homework #4
MATH 4443/5443

1. Let f and g be Riemann integrable functions on $[a, b]$.

a) Prove that $f + g$ is Riemann integrable on $[a, b]$.

b) Use Riemann sums to prove that $\displaystyle\int_a^b f(x) + g(x)\,\mathrm{d}x = \int_a^b f(x)\,\mathrm{d}x + \int_a^b g(x)\,\mathrm{d}x$.

2. Let f be Riemann integrable on $[a, b]$.

a) Prove that $|f|$ is Riemann integrable on $[a, b]$.

b) Prove that $\displaystyle\left|\int_a^b f(x)\,\mathrm{d}x\right| \leq \int_a^b |f(x)|\,\mathrm{d}x$.