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
      \[ \int_a^b f(x) + g(x) \, dx = \int_a^b f(x) \, dx + \int_a^b g(x) \, dx. \]

2. Let $f$ be Riemann integrable on $[a, b]$.
   a) Prove that $|f|$ is Riemann integrable on $[a, b]$.
   b) Prove that
      \[ \left| \int_a^b f(x) \, dx \right| \leq \int_a^b |f(x)| \, dx. \]