M 384: Assignment 2

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Exercises 6.2.4 — Problem 6

Problem. Prove that if f and g are Riemann integrable on $[a, b]$, then $f * g$ is Riemann integrable on $[a, b]$.

Proof.

□

Exercises 6.2.4 — Problem 9

Problem. If f is a Riemann integrable function on $[a, b]$ prove that $F(x) = \int_a^x f(t)dt$ satisfies a Lipschitz condition.

Proof.

□

Exercises 6.2.4 — Problem 10

Problem. If f is Riemann integrable on $[a, b]$ and continuous at x_0, prove that $F(x) = \int_a^x f(t)dt$ is differentiable at x_0 and $F'(x_0) = f(x_0)$. Show that if f has a jump discontinuity at x_0, then F is not differentiable at x_0.

Proof.

□