MATH 5105 Differential and Integral Analysis
Assignment 4

1. Let $g : [a, b] \to \mathbb{R}$ be bounded. We have proved that if g is Riemann integrable on $[a, b]$, then so is g^2. Prove or disprove the converse: if g^2 is Riemann integrable on $[a, b]$ then g is Riemann integrable on $[a, b]$.

2. Assume that $h : [a, b^2] \to \mathbb{R}$ is a continuous function and let $G : [a, b] \to \mathbb{R}$ denote the following function,

$$G(x) = \int_a^{x^2} h(t)dt.$$

   Show that G is differentiable and find its derivative.