MA 544: Homework 11

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April 13, 2016

Problem 11.1 (Wheeden & Zygmund §7, Ex. 11)

Prove the following result concerning changes of variable. Let $g(t)$ be monotone increasing and absolutely continuous on $[\alpha, \beta]$ and let f be integrable on $[a, b]$, $a = g(\alpha)$, $b = g(\beta)$. Then $f(g(t))g'(t)$ is measurable and integrable on $[\alpha, \beta]$, and

$$\int_a^b f(x)dx = \int_\alpha^\beta f(g(t))g'(t)dt.$$

(Consider the case when f is the characteristic function of an interval, an open set, etc.)

Proof. ■

Problem 11.2 (Wheeden & Zygmund §7, Ex. 15)

Proof. ■

Problem 11.3 (Wheeden & Zygmund §5, Ex. 8)

Proof. ■

Problem 11.4 (Wheeden & Zygmund §5, Ex. 11)

Proof. ■

Problem 11.5 (Wheeden & Zygmund §5, Ex. 12)

Proof. ■

Problem 11.6 (Wheeden & Zygmund §5, Ex. 17)

Proof. ■