

MA 544: Homework 11

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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**

Proof. ■

PROBLEM 11.3

Proof.



PROBLEM 11.4

Proof.



PROBLEM 11.5

Proof.



PROBLEM 11.6

Proof.



PROBLEM 11.7

Proof.



PROBLEM 11.8

Proof.



PROBLEM 11.9

Proof.



PROBLEM 11.10

Proof.

