NUMBER THEORY II
FALL 2012

ASSIGNMENT 12
DUE DECEMBER 4

Exercise 1. If $F(x)$ is defined for $x \geq 1$, $\alpha(n)$ is a completely multiplicative arithmetic function, and

$$G(x) = \sum_{n \leq x} \alpha(n) F\left(\frac{x}{n}\right),$$

prove that

$$F(x) = \sum_{n \leq x} \alpha(n)\mu(n) G\left(\frac{x}{n}\right).$$

[*Suggestion:* Substitute the definition for G in the right hand side, then reverse the order of summation.]

Exercise 2. Exercise 7.5

Exercise 3. Exercise 7.6 [*Suggestion:* Use Theorem 7.3 and Abel summation.]