

Do the following exercises from the text:

Section 8.1: 2

Section 8.2: 3

Section 8.3: 3

Additional Exercises on the Möbius function (Section 8.4).

1. Find the following values of the Möbius function.

(a) $\mu(12)$ (b) $\mu(15)$ (c) $\mu(30)$ (d) $\mu(50)$

(e) $\mu(1001)$ (f) $\mu(2 \cdot 3 \cdot 5 \cdot 7 \cdot 11 \cdot 13)$ (g) $\mu(10!)$

2. Show that if n is a positive integer, then $\mu(n)\mu(n+1)\mu(n+2)\mu(n+3) = 0$.

3. Suppose that f is a multiplicative function with $f(1) = 1$. Show that

$$\sum_{d|n} \mu(d)f(d) = (1 - f(p_1))(1 - f(p_2)) \cdots (1 - f(p_t)),$$

where $p_1^{k_1} p_2^{k_2} \cdots p_t^{k_t}$ is the prime power factorization of n .