Easier way: use Abel's identity (eg s p78):

Let $a(n) = \Lambda_1(n)$ and $f(x) = x$

$$\therefore \sum_{n \le x} n\Lambda_1(n) = \theta(x).x - \int_1^x \theta(t)dt \quad \text{wh. } \theta(x) = \sum_{n \le x} \Lambda_1(n)$$

$$\therefore \theta_1(x) = x \sum_{n \le x} \Lambda_1(n) - \sum_{n \le x} n\Lambda_1(n)$$

$$= \sum_{n \le x} (x-n)\Lambda_1(n) \quad \text{as required.}$$