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Marc Chamberland* (chamber1@grinnell.edu), 1116 8th. Ave., Grinnell, IA 50112. *Analytic Formulas for the Euler Totient Function*. Preliminary report.

Starting with the formula

$$\sum_{k=1}^n ka_k = \sum_{j=1}^n \phi(j) \sum_{l=1}^{\lfloor n/j \rfloor} a_{lj}$$

which holds for all sequences $\{a_k\}_1^n$, we construct known and unknown formulas involving the totient function. These include finite and infinite sums involving the harmonic numbers, L-series, polylogarithms and Dirichlet characters. (Received September 19, 2017)