

R. S. Melham

*Sums of Reciprocals of Weighted Products of the Sine and Cosine Functions,*

Fibonacci Quart. **56** (2018), no. 2, 99–105.

**Abstract**

In this paper, we define 12 families of finite sums that involve the sine/cosine functions. Four of these families are parametrized by  $j$ , and the remaining eight families are parametrized by  $j$  and  $k$ . In each of the aforementioned 12 families, the denominator of the summand contains a product of sine or cosine functions, and the length of this product is governed by the parameter  $j$ . As such, the length of the product in question can be made as large as we please.

In each of the 12 families of finite sums that we consider, there is a so-called *weight term* in the summand. For instance, in  $S_4$  (defined in Section 2), the weight term is  $(\frac{1}{2\cos j})^i$ .