Decomposition formulas for cosine and sine operator functions

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Decomposition formulas are constructed for the cosine and sine operator functions on the basis of the well-known trigonometric formulas. Validity of these formulas are proved for the case when the argument is a sum of two bounded operator. The paper offers the algorithm which allows to build any high-order precision splitting formula for cosine operator function. More precisely, the algorithm allows to obtain 2p+2 (p is an natural number) order splitting formula from 2p order splitting formula.