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A unified method for evaluating several infinite series.

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Summary: We use a trigonometric identity and integral calculus to evaluate several infinite series; in particular, we deduce the corresponding partial fraction decomposition of $\cot x$, $\csc x$, $\coth x$ and $\operatorname{csch} x$.

Classification: I30 I50

Keywords: infinite series; partial fraction; integral calculus

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