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On transcendence of certain series

In 1737, Euler proved that $\zeta(2k)$ is a rational multiple of π^{2k}. Since then, there have been several generalizations of Euler's result. One such question is to evaluate and determine the arithmetic nature of the general series, $\sum_{n=1}^{\infty} A(n)/B(n)$, where $A(X)$ and $B(X)$ are suitable polynomials. Although it is possible to express these sums in terms of the polygamma functions, their arithmetic nature still remains a mystery. In this talk, we will discuss analogs of this problem in two different scenarios.