*Summation of SERIES* is the method of finding the sum of the terms of an infinite ſeries produced to infinity, or the ſum of any number of terms of ſuch a

Teries.

The value of any arithmetical ſeries, as 12 + 22 + 32 + 42.... n2, varies according as (n) the number of its terms varies ; and therefore, if it can be expressed in a general manner, it muſt be explicable by n and its powers with determinate coefficients ; and thoſe powers, in this caſe, muſt be rational, or ſuch whoſe indices are whole poſitive numbers ; becauſe the progreſsion, being a whole number, cannot admit of ſurd quan­tities. Laſtly, it will appear that the greateſt of the said indices cannot exceed the common index of the ſeries by more than unity : for, otherwiſe, when *n* is taken indefinitely great, the higheſt power of n would be indefinitely greater than the ſum of all the reſt of the terms.

Thus the higheſt power of n, in an expreſſion exhi­biting the value of 12 + 22 + 32 + 42.... n2, cannot be greater than n3 ; 12 + 22 + 32 + 42.... n2, manifeſtly leſs than n3, or n2 +n2 +n2 +, &c. continued to n terms ; but n4, when *n* is indefinitely great, is indefi­nitely greater than n3, or any other inferior power of n, and therefore cannot enter into the equation. This being premiſed, the method of inveſtigation may be as follows :