

118. The third division will be as follows :

Divisor.

Quotient.

$$1+x) (1-3x+6x^2-10x^3+15x^4-21x^5+28x^6-36x^7+45x^8-55x^9+66x^{10}-78x^{11}+\&c.$$

Dividend.

$$\begin{array}{r} 1-2x+3x^2-4x^3+5x^4-6x^5+7x^6-8x^7+9x^8-10x^9+11x^{10}-12x^{11}+\&c. \\ 1+x \\ \hline * -3x+3x^2 \\ -3x-3x^2 \\ \hline * +6x^2-4x^3 \\ +6x^2+6x^3 \\ \hline * -10x^3+5x^4 \\ -10x^3-10x^4 \\ \hline * +15x^4-6x^5 \\ +15x^4+15x^5 \\ \hline * -21x^5+7x^6 \\ -21x^5-21x^6 \\ \hline * +28x^6-8x^7 \\ +28x^6+28x^7 \\ \hline * -36x^7+9x^8 \\ -36x^7-36x^8 \\ \hline * +45x^8-10x^9 \\ +45x^8+45x^9 \\ \hline * -55x^9+11x^{10} \\ -55x^9-55x^{10} \\ \hline * +66x^{10}-12x^{11} \\ +66x^{10}+66x^{11} \\ \hline * -78x^{11}+\&c. \\ -78x^{11}-\&c. \\ \hline * + \end{array}$$

By this division it appears that the fraction $\frac{1}{1+x^3}$ is equal to the infinite series $1 - 3x + 6x^2 - 10x^3 + 15x^4 - 21x^5 + 28x^6 - 36x^7 + 45x^8 - 55x^9 + 66x^{10} - 78x^{11} + \&c.$ in which, as in the two former quotients, the second, fourth, sixth, eighth, tenth, twelfth, and other following even terms have the sign — prefixed to them, or are to be subtracted from the first term 1; and the third, fifth, seventh, ninth, eleventh, and other following odd terms have the sign + prefixed to them,