We present a concise and elementary derivation of the complete asymptotic expansion for the factorial function $n!$, that we will refer to as the Stirling’s series. While there have been numerous published proofs of the Stirling’s series and of its classical dominant term given by Stirling’s formula

$$\lim_{n \to \infty} \frac{n^ne^n}{n^n\sqrt{2\pi n}} = 1,$$

the present treatment produces some new expressions for the coefficients. In addition, it brings to light the simple relationship between the asymptotic expansions of $n!$ and $1/n!$ that, even though easily derived from the well-known expansion of $\log \Gamma(z)$ in terms of the Bernoulli numbers, seems to have no simple published proof. (Received September 16, 2008)