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Stirling Without Wallis,
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Abstract

It is fairly easy to show that

$$n! \ \sim \ Cn^{n+\frac{1}{2}}e^{-n} \ \text{ as } \ n \to \infty,$$

and it is then standard procedure to use Wallis' product to show that

$$C = \sqrt{2\pi}.$$

The purpose of this note is to show that there is an alternative route to determining C.