

First Document

Julian Liaw

March 15, 2022

Definitions of e

Let's begin with a formula $e^{i\pi} + 1 = 0$.

1. As a **limit**:

$$\begin{aligned} e &= \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n \\ &= \lim_{n \rightarrow \infty} \frac{n}{\sqrt[n]{n!}} \\ &= \lim_{t \rightarrow 0} (1+t)^{\frac{1}{t}} \end{aligned} \tag{1}$$

2. As a *sum*:

$$e = \sum_{n=0}^{\infty} \frac{1}{n!}$$

$$\begin{aligned} e^x \approx 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \frac{x^5}{5!} + \frac{x^6}{6!} + \frac{x^7}{7!} \\ + \frac{x^8}{8!} + \frac{x^9}{9!} + \frac{x^{10}}{10!} + \frac{x^{11}}{11!} + \frac{x^{12}}{12!} + \frac{x^{13}}{13!} + \dots \end{aligned} \tag{2}$$

3. As a continued fraction:

$$e = 2 + \frac{1}{1 + \frac{1}{2 + \frac{1}{3 + \frac{1}{4 + \frac{1}{5 + \ddots}}}}}$$

Equation 1 was really cool

Table 1: A nifty table!

1	2
3	4000000000000000000000000000000

More Tricks

I like table 1

I am so proud of figure 1

Example:

You should like and subscribe!



Figure 1: I did it!